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ABSTRACT

This thesis discusses normal principles of infant development during the first 2 to 3 months of life and applies these principles to the provision of services to drug-exposed infants. Emphasis is on the infant as an active and interactive participant in his/her own development, the primacy of the body during this early developmental period, and the interrelatedness of physical experience and emotional development. Chapter 1 examines underlying assumptions of the infant's basic nature. Cultural assumptions are discussed as is the infant's capacity for subjective experience. Chapter 2 outlines key principles and processes of normal development and provides information on neurobehavioral organization and the organizational model. Chapter 3 evaluates the emotional development and subjective experience of the infant. The infant's achievement of basic trust, ego integration, and the "coming into being" of the infant's true self is discussed. Chapter 4 provides information on the medical and neurobehavioral effects of intrauterine drug exposure. Also discussed is how various environmental variables impact development of hospitalized infants. Chapter 5 describes a hospital-based early intervention program which stressed that effective clinical interventions with very young drug-exposed infants should be based on normal development. (Contains over 100 references.) (Author/CR)

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"The Infant's Body"

A Study of Normal Development, 0- 2 Months, and its Application to Early Intervention with Drug-Exposed Infants in a Neonatal Intensive Care Unit

By

Anat Weisenfreund

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A Study of Normal Development, 0-2 Months, and its Application to Early Intervention with Drug-Exposed Infants in a Neonatal Intensive Care Unit

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ABSTRACT

This paper is concerned with a study of key principles and processes of normal development in the first two to three months of life, and their application to early intervention with drug-exposed infants in a Neonatal Intensive Care Unit. Throughout, the infant is viewed as an active and interactive participant in his own development, and particular emphasis is placed on the primacy of the body in the first two to three months of life. The essential interrelatedness of physical experience and emotional development is discussed, and considered in the context of the caregiving environment. The special situation of hospitalized, drug-exposed infants is examined, with a particular focus on neurobehavioral and environmental effects of intrauterine drug exposure. Through discussion and illustration, a hospital-based early intervention with this population is described. It is postulated that effective clinical interventions with very young drug-exposed infants should be based on normal developmental principles, and be applied in light of their special circumstances.

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PREFACE

Several strands of experience, personal as well as professional, converged and fed into this paper and into the design and establishment of the NICU-based, early intervention program for drug-exposed infants discussed in this work. I would like to begin by tracing and recounting two influential components of my own journey - the theoretical and experiential studies in infant motor development, touch and movement facilitation at the School for Body Mind Centering in Amherst, Massachusetts, and my graduate studies in Infant and Parent Development at Bank Street College of Education in New York City. In telling some of this history I hope to show the development of the interests and questions that underlie my work with very young infants, and by implication, to make available some of the assumptions that have guided and continue to influence this work.

In 1987 I began my studies with Bonnie Bainbridge Cohen, an occupational therapist and dancer trained in Neuro-Developmental Treatment (NDT) and the founder and educational director of the School for Body Mind Centering in Amherst, MA. From 1988 - 1990, I attended and completed the Practitioner Certification Training Program offered by the school and for these two years I studied the principles and techniques of Body-Mind Centering (BMC), as well as acquiring a solid base in anatomy, physiology, and kinesiology.

BMC is unique in that its application in bodywork and movement is based on developmental principles, and the study of movement and perceptual development in the first year of life constitutes the core of the two year, full time curriculum. Another aspect quite unique to BMC is its approach to learning: students, in addition to acquiring a substantial

theoretical knowledge base, spend a great deal of their time in cooperative and experiential explorations of the subject at hand. For example, during the study of the reflexes and how they become integrated into more mature and voluntary early movement patterns, students learn not only by studying the name, function and neural integration of the reflex, but might also spend a considerable amount of time attempting to elicit various reflexes in our adult bodies and then exploring -through touch, movement and words- how this reflex becomes functional in reaching, rolling, creeping or crawling. This way of learning, which includes theoretical as well as strong experiential components was invaluable in that it encouraged and supported multi-layered experience and intelligence. I began to be able to value that which I can learn, use and "know" with my mind, as well as that which I might learn, use and "know" in my body, and through the history of my own body tissues. I believe that the experiential components of the developmental work laid a strong foundation for my ongoing interest in the infant's subjective bodily experience. That is, by re-working and re-experiencing many of the early developmental patterns in my own body, I think that I was able to gain a deeper understanding of the infant's early integrative challenges than if I had studied movement development as it is studied traditionally, from a strictly theoretical and visual perspective.

In sum, it was through my intensive studies in BMC that I became fascinated and engrossed in the study of early development and particularly with the significant and largely unexplored role of the body and with the subjective experience of the infant at a predominantly preverbal and pre-representational time in his development. During this time, the main theoretical base for these interests was my study of the primitive reflexes,

righting reactions and equilibrium responses, the basic neurological patterns, and how these build on another and interact to provide the developing human with the baseline for normal movement.

The study of development continued to hold my interest and I began working with young children as an assistant teacher in a day care setting. Though I now had a fairly strong base in movement development, both in terms of observation and facilitation of the development of normal movement, it became clear to me that I needed additional information about infant development, this time from the perspective of psychology and learning. I was seeking an integration and a broadening of my knowledge base as well as further credentials that would allow me to work with infants in clinical settings. In the fall of 1990, I enrolled at Bank Street College of Education, in their two year Master's Degree Program in Infant and Parent Development. It was during this time that I gained a theoretical grounding in social, cognitive and emotional development in the first three years of life, though my own interests remained most focused in the first months of the first year of life.

As I was acquiring invaluable new information and new ways to think about the young infant, I also remained committed to my studies of the body and movement. In exploring and assimilating different ways to think about development, I became acutely aware of the seemingly large gap between developmental psychology and theories of the body and sensori-motor development. While most theories of infant development do pay tribute to the importance of the body in early development, this is usually expressed either in separate chapters on motor development or in the context of cognitive development, where the focus is on the infant's relatively

sophisticated ability to discriminate through visual or auditory channels. I found very little theoretical, and even less empirical investigation on issues such as the relationship of sensori-motor to emotional development or the contribution of touch to the infant's developing sense of self. It was my growing awareness and analysis of the gaps in the literature which finally enabled me to articulate my own interests and questions more clearly than before.

I came to know that my main interests are with the preverbal infant at a time in his development before the emergence of representational thought, but where there certainly is a human being, actively contributing to his evolving organization; that I was interested in the infants pre-representational "intelligence," that is, in the mechanisms and channels through which he feels, senses, discriminates, integrates, processes and acts. Further, I became committed to exploring what I perceived as the significant relationship between the body, early feelings and the developing self. In my thinking, writing and most potently in my clinical work with drug-exposed neonates in a medical setting, I pursued the question: How is the emotional component of early bodily experience organized into the infant's developing self?

INTRODUCTION

The present work is concerned with a study of key principles and processes of normal development in the first two to three months of life, and their application to early intervention with drug-exposed neonates in a medical setting. The impetus for the present paper came out of both my graduate studies in infant development and from my clinical work with drug-exposed infants and their families in a Neonatal Intensive Care Unit of a large teaching hospital in an urban setting. In my ongoing involvement with both theory and practice, I have consistently found essential linkages between the two: my theoretical understanding of early infancy has greatly influenced my clinical work, and the clinical work with drug-exposed babies, in turn, continually affects my theoretical constructs. While the relationship between the two is often peaceful - that is, my clinical work validates my understandings in the theoretical realm and vice versa- it is also occasionally tumultuous, as when a new observation in the clinical realm forces me to rethink my constructs.

This paper is the result of the active relationship between theory and practice, and is concerned as much with a revision or re-integration of normal theoretical principles of early development as with their application to early intervention with hospitalized, drug-exposed neonates. It is my hope that this work will help to improve the care of this special population, as well as contribute constructively to the ongoing process of constructing increasingly integrated and accurate theories of early infant development.

Theoretical Contributions to Clinical Work

There are many stereotypes, prejudices and misconceptions

surrounding drug-exposed babies, and these babies tend to be viewed in a pathological light. They are alternately portrayed as the "smallest victims" of "bad" mothers, or as "little junkies" themselves. Implicit in these views is that there is something inherently "wrong," with these babies, and that they are somehow and irreversibly "damaged." Despite the heterogeneous, diverse make-up of the population of drug-exposed infants, and despite the myriad of unknown factors regarding developmental outcome of this population (Lester and Tronick, 1994), media coverage consistently misrepresents and carelessly labels these babies as "premature, brain-injured, unteachable, unreclaimable and even unadoptable (Kandall, 1991)." This same tendency that pathologizes drug-exposed infants is also reflected in the common term "crack baby," implying that the baby's identity is essentially bound up with his intrauterine cocaine exposure.

While some of these prejudices and misconceptions may not be as rampant and unexamined in the setting of a Neonatal Intensive Care Unit, the drug-exposed neonate is still primarily seen in a pathological light, not first and foremost as a baby attempting to master the normal developmental path, but as the "patient" in need of "treatment." Further, not only is the baby viewed as the "symptomatic" patient, but the general lack of staff awareness regarding normal developmental processes in the early weeks of life compounds the baby's difficulties. For example, actions based on beliefs such as "crying is good for the lungs," or "picking the baby up too much will spoil him" impacts particularly negatively on a baby going through withdrawal, whose capacity for early neurobehavioral organization is especially dependent on prompt responses to his cues[1].

[1] For the purposes of the present work, the infant will generally be referred to as "he," and the clinician will generally be referred to as "she."

In light of the above, I believe that the central contribution of normal theories of early development to clinical work with this population is that it highlights a normative rather than a pathological perspective, and this is the position taken and explored in this paper. In light of our present knowledge, the majority of drug-exposed infants should be viewed as normal infants with special challenges (Lester and Tronick, 1994), or as infants potentially "at risk" (TIP manual, 1993) for abnormal development, due to a complex interplay of biological, developmental and environmental factors. A focus on normal development seems therefore especially appropriate for this population. It is an assumption of my clinical work and of this paper that strengthening the normal developmental patn of drug-exposed babies will facilitate the mobilization of their own resources, and assist them with coping more effectively with various developmental challenges.

Clinical Contributions to Theory

Just as developmental theory impacts powerfully on clinical practice, so clinical practice sometimes draws attention to present theoretical limitations, and forces a re-examination of present theoretical constructs and assumptions. In clinical work with infants, the clinician does not interact with "domains of functioning" or "subsystems of behavioral organization, " but with a whole baby. The "clinical infant" (Stern, 1985) is a passionate, sensuous young human being, whose ways of functioning are overlapping, essentially interrelated, very complex and very primitive at the same time.

What I find particularly striking in my own clinical work concerns the very young infant's body-based existence. A major proposition in this work and in the present paper is that for the very young infant, physical experience

is the medium for cognitive, social, motor and emotional learning. The very young baby communicates primarily through the "language" of his body and senses, and emotional development, the development of a sense of self and physical experience are especially and significantly intertwined at this early stage. While many of the major theorists of infant development, no matter how divergent their emphases and points of view, tend to agree on the primacy of the body in the first two to three months of life, an integrated view has not yet emerged.

Various approaches taken to understand the infant's physical experience in this early period have included perspectives on movement and sensori-motor organization from the fields of sensory integration and occupational and physical therapy (Ayres, 1991, 1987, Bly, 1994, Finnie, 1975, Fiorentino 1981, Kamm, Thelen and Jensen, 1990, Williamson, 1988), early intervention (Connor, Williamson and Siepp, 1978), as well as from the less mainstream, yet rapidly growing field of movement analysis and bodywork (Bainbridge-Cohen, 1993). Early motor development has also been studied in the field of developmental psychology (Gerber, 1979, McGraw, 1943, Pikler, 1972) and most recent and important advances have been made in this area by Esther Thelen and her colleagues (Thelen, 1995, Lockman and Thelen, 1993, Kamm, Thelen and Jensen, 1990). As we will see, the infant's body and physical actions have also been examined in light of their pivotal role in the development of cognition (Piaget, 1952), and psychoanalytic as well as developmental approaches have contributed greatly to our understanding of the role of early physical experience in the areas of attachment, social interaction and emotional development (Ainsworth, 1972, Bowlby, 1969, Erikson, 1950, Mahler, 1975, Montagu, 1971, Ribble, 1965, Sander, 1976, Stern,

1985, Winnicott, 1965). Finally, medical professionals and psychologists involved in research and clinical practice (Emde and Buchsbaum, 1989, Greenspan, 1992, Brazelton, 1989, Als, 1979, 1982, Prechtl, 1993) have refined behavioral organizational models that let us better observe, respond and understand the "language" of the young infant's physical expressions.

While we clearly have access to a great wealth of information regarding the young infant's body and the significance of his early physical experience, a cognitive bias still dominates the field, and an integrated theoretical perspective has not been constructed to date[2]. In the present work, I attempt some of this integration in my presentation of normal developmental principles and processes. I further hope to show that a theoretical background that addresses the primacy and essential interrelatedness of the body and physical experience with other areas of early functioning is especially useful when applied to clinical work with neonates.

Limitations of the Present Work

The central limitation of the present work concerns my almost exclusive focus on the infant. Winnicott (1965) once stated that "there is no such thing as a baby," meaning that an infant's functioning is essentially related to the type and quality of his caregiving environment. Especially in early infancy, where neurobehavioral organization is so dependent on a social "matrix" (Als, 1979), and the infant requires a "regulating other" (Tronick, 1994) to master his emerging developmental tasks, the infant cannot be viewed in isolation. However, while I do attempt throughout to maintain

[2] It should be noted that the last five years have seen a resurgence in interest in the area of motor development, and theoretical integration has begun to move forward at a greater speed. Thelen's (1995) most recent work provides a good historical overview and describes the new directions in knowledge and research.

these conceptual linkages, it is outside the scope of this paper to fully address the caregiving environment of the infant. This becomes clear in my discussion of normal development, also in addressing the environmental variables affecting the drug-exposed infant, and most pertinently in my discussion of intervention with the drug-exposed neonate: Although the NICU-based, early intervention program as it functions at the present time does incorporate extensive work with the infant's parents, medical staff, and also involves active negotiations of the medical system as a whole, the discussion of these areas lie outside the scope of the present work.

Overview

Chapter 1 provides a philosophical foundation for the rest of this paper. It argues that central to an understanding of both normal early development and clinical intervention with an infant is an examination of our own underlying assumptions regarding the infant's basic nature, his "humanness," personhood and sense of self. In this chapter, I examine widespread cultural assumptions regarding the very young infant, and argue that research, intervention, as well as caregiving of the young infant is influenced and hampered by our deeply held and largely inarticulate assumptions in this regard. While documenting recent theoretical advances (Stern, 1985, 1990), this chapter will argue that due to our own socialization, which includes the isolation, repression and denigration of the body and physical experience, the very young infant's largely endogenous, sensory, body-based way of being in world is perceived as "other," and his self and subjective experience repeatedly rejected and denied.

The main propositions put forth in this chapter include that the infant

is a human being with an "emerging" (Stern, 1985) sense of self, and with the capacity for subjective experience; that in the earliest weeks of life the body is the main vehicle for perception, sensation and action or expression; that during this period of time emotional and physical experience are essentially intertwined; and that an effective caregiver, researcher or clinician must be able to "hear" and re-learn to "speak" the infant's early, body-based "language."

Chapter 2 outlines and examines several key principles and processes of normal development in the first two to three months of life which serve as reference points throughout this work, and also provides the theoretical context from which to view the early development of the drug-exposed infant. I begin by discussing the transactional nature of the developmental process (Sameroff, 1975), and examine the assumptions that the infant is an active and interactive participant in his own development (Piaget, 1952), with constitutional "self-righting" and "self-organizing" abilities (Sameroff, 1975). The "Two Month Shift" (Emde and Buchsbaum, 1989) is described and discussed to delineate the scope of the present developmental focus, and its significance as a developmental marker for infants and parents alike is addressed. Other propositions that are put forth are that there seem to be individual differences among infants from birth (Thomas and Chess, 1977, Escalona, 1976) , and that the infant cannot live and develop in isolation, but requires a caregiving environment and mutual regulation (Tronick, 1994) to provide the human context or "matrix" (Als, 1979) for his emerging organization.

The concept of neurobehavioral organization and the organizational model (Brazelton,1989, Als, 1979, 1982) in particular are highlighted as the

most clinically useful way of conceptualizing the very young infant's experience and behavior. It is proposed that one of the infant's main early tasks is the organization of his various experiences in the autonomic, motor, state, attentional and interactive realms, and that his overall functioning is a direct reflection of his organizational and integrative abilities. This chapter discusses the various subsystems of early functioning, including the autonomic, motor, state, and interactional/attentional systems, and how they are affected by the caregiving environment. Each of these realms is examined in light of the infant's contributions as well as those of his immediate environment, and examples of "behavioral organization" are contrasted with "behavioral disorganization" in each of the subsystems. Throughout, the central role of the body and physical experience is highlighted.

Chapter 3 addresses the emotional development and subjective experience of the very young infant. It argues that while the organizational model provides us with a means to understand many of the infant's behaviors and early, body-based "language," it does not address the more passionate side of his being and does not enter the realm of uncovering his subjective emotional experience. Using mainly the theories of Erikson (1960) and Winnicott (1960, 1962, 1963, 1964, 1965), the infant's negotiation of the key emotional issues of this developmental stage are discussed.

It is postulated that normal emotional development is characterized by the infant's achievement of "basic trust" (Erikson, 1960), "ego integration," and the "coming into being" of the infant's "true self" in the context of a good- enough "holding environment." (Winnicott, 1960, 1962, 1963, 1964, 1965). The psychological results of a failure of good-enough "holding" are

also addressed and as in the other chapters, the primacy of the body and its interrelatedness to other areas of functioning is highlighted.

Against the background of normal developmental principles, Chapter 4 provides an overview of the special situation of drug-exposed infants. Medical and neurobehavioral effects of intrauterine drug exposure, as well as what is presently known regarding developmental outcomes is documented and discussed, with a main focus on opiates and cocaine. This chapter also addresses the special situation of hospitalized, drug-exposed neonates and how various environmental variables further impact on their early development.

This chapter's main propositions include that drug-exposed infants are not a homogenous group and that type, quality and timing of exposure, normal neonatal individual differences and other factors such as the mother's health, reproductive history and the family's social and economic status all impact powerfully and differentially on these babies; that the majority of drug-exposed infants are not "damaged" or otherwise neurologically "compromised;" that due to medical, neurobehavioral and environmental challenges they are often affected by varying degrees of neurobehavioral disorganization; that due to a host of confounding variables, developmental outcomes are still unknown; that the environment's ability to respond in an individualized and dynamic manner to the infant appears to be a key determinant of developmental outcome; and lastly, that as a consequence of the above, early intervention that is based on normal developmental principles, while addressing the special challenges of this population, appears indicated for hospitalized, drug-exposed neonates.

Lastly, Chapter 5 describes a developmental approach to early

intervention with drug-exposed infants, implemented in the NICU of a large, urban teaching hospital. The main focus of this chapter concerns the process and content of clinical interventions with drug-exposed infants throughout their hospital stay. While recognizing and treating symptoms related to intrauterine drug-exposure, this intervention has as its main focus the strengthening of the baby's normal developmental path. It is a central proposition of this chapter that the facilitation of normal developmental processes is key toward helping the individual infant master his special neurobehavioral, emotional, and environmental difficulties.

In the first section of this chapter, the major components of the process of intervention are described and discussed. The characteristics of the circular and ongoing processes of observation, assessment and intervention are explored, and the role of the clinician, including the separate but interrelated cognitive, emotional and physical components of skill required to accurately observe, assess and intervene with the very young infant will be addressed. The second section of this chapter illustrates the intervention itself, and applies normal developmental principles and processes, as well as our understanding of the special challenges of drug-exposed infants, to early intervention techniques and processes with drug-exposed infants.

CHAPTER 1

THE INFANT AS A HUMAN PERSON

"The story of a human being does not start at five years or two, or at six months, but starts at birth- ...each baby is from the start a person, and needs to be known by someone." D. Winnicott, 1964

"All that I have said will have emphasized the value and importance of realizing how extraordinarily human babies...are... Babies are immature human beings, but human all the same." S. Isaacs, 1952

"[not until]...somewhere in the middle of the first year ...[is he]...becoming a person.....At this point we can officially welcome the infant into the human fraternity...It is at this point in the infant's development that we find ourselves saying, "Why, he's becoming a person - a real person!" S. Fraiberg, 1959

"In the course of the first 3 years of life the child becomes transformed from a squirming, crying and impulsive creature into a thinking and talking human being." M. Anisfeld, 1984

I begin with the issue of the infant's humanness, personhood and sense of self because I believe that our view on this topic is the philosophical foundation for all our theoretical constructs and thinking on early infant development, and also forms the (often inarticulate or unconscious) basis for our care and intervention with the young infant.

This topic is many-layered and in many ways enormously complex, since it deals directly with our historical, cultural and personal constructions of what constitutes a human being, a person and a sense of self: What kind of person is the infant in the first two to three months of life? Is he a "person" at all yet, with a meaningful subjective experience and an active and finely tuned ability to learn and to respond creatively to his environment? Perhaps we believe that the very young infant is more animal than human, a primitive psyche blindly driven by bodily needs, Anisfeld's "creature" or, as Gould (1982) suggests, functionally an embryo outside the womb? And what is it then that is meant by "primitive," and "animal" -like, and what historical, political and psychological connotations do those very loaded words have for us?

The dominant western culture in which we live and work carries with it a deeply embedded tradition of a hierarchy of value and its resulting dichotomies. In this dominant cultural and political construct, simplistically put, mind is deemed superior to matter, cognition valued more than physical experience and feeling, and a sharp distinction is made between self and "other." Class status, race, ethnicity, gender, age and degrees of "person-hood" have historically been organized along these lines. Clearly, the struggle of debunking and re-structuring these dichotomies is an ongoing one. But what does any of this have to do with the development of the young infant, his

humanness, his personhood, his sense of self? I would argue that our view of him is embedded and entangled in the framework of our cultural dichotomies. Because of his intensely sensory and physical nature, for many he represents that which is lesser, lower, not cognitive, not quite part of us.

No one would argue with much success that a human infant is not actually human and in fact, influential theorists such as Margaret Ribble (1965), Susan Isaacs (1952), D.W. Winnicott (1960, 1962, 1963, 1964, 1965) and Daniel Stern (1977, 1985, 1990) never lose sight of the young infant's humanity. However, it has been said that he is not quite, well, not quite a person. Many parents, as well as researchers and clinicians will attest that there is something 'different' about the young infant during the first two to three months. These are the months before the social smile, before periods of reliable and sustained eye contact, before the infant can hold his head upright with minimal assistance, before he coos in pleasure and sleeps through the night. The first weeks of life especially are a period of time when the infant's attentional abilities are determined by his state behavior, and much of his energy seems to be used towards the necessary attainment of endogenous organization and control (Emde and Buchsbaum, 1989), and where he is not thought to be able to differentiate between himself and the object world (Piaget 1952, Mahler, 1975).

The infant's language is one of the body: It is the regularity of his breathing, his skin tone, the ease of his bowel movements and other autonomic functions that communicate that he is in "balance" and feeling well. Many of his movements are reflexive: involuntary, automatic and present in response to specific stimuli. It is the appropriateness of his responses and the smoothness of his movements - such as the turning of his

head towards the nipple, the reach of his lips, his latching on and his coordinated breathing, sucking and swallowing in feeding - that communicate his competence. In his transitions from one state to another we see reflected the organization of his nervous system and his beginning ability to attend as well as to reject, which form the basis of his important ability to discriminate and to actively invite or shut out environmental stimuli. His is a language of the body. He lets us know pleasure and well-being by relaxing his muscles into gravity, allowing himself to be held, responding accurately to subtle changes in position without defensive reactions. In this state, the infant can mold against his caregiver's body. When the infant is in a state of discomfort, this too we see, feel and hear through his physical actions. He may make small fussing sounds, push his body into extension, frown or grimace. When picked up he may feel stiff and strain away from the caretaker. His muscles will feel tense and he may show defensive movements even in response to small vestibular changes. The young infant's being is exquisitely tuned to sensations arising both from within his own body as well as from the surrounding environment and it is through his body's actions and responses that he communicates.

What especially is it about all this that makes this young being seem so 'different' from us or even from an older infant and child? I believe that we construct this 'difference' based primarily on the fact of the infant's sensory, body-based and body-centered existence. That is, it is the "lower," "animal-like" form of functioning which defines the neonate's 'difference' for us. I have gone on at length about all this because I believe that our cultural as well as our personal assumptions, beliefs, interpretations of this early state, as well as our own early sensori-motor experiences profoundly effect and

continue to shape our theories about the infant self. Specifically, I believe that it is our own comfort and conceptual ability to allow pre-representational body-based experience into the realm of what it means to be human that directly informs our ability to ascribe meaningful subjective experience or a sense of self to the young infant.

Finally, the young infant presents us with a challenge: he requires a body based awareness and ability to respond from his caretakers, from clinicians, as well as from those who wish to study his behaviors for research purposes. To understand an infant's communications, we must enter into his way of communicating. In order to interact successfully with a young baby, to love, nurture, protect and communicate with him, in order to help him learn, we cannot just talk to him, show him how something is done, tell him that we love and care for him or expect he'll understand why we can't answer his cries right now but will be able to in another five minutes. If we wish to study the young baby, we cannot just observe him with our visual senses, but must learn to physically feel, understand and honor the subtle and less quantifiable changes that take place on the level of his body tissues. In order to interact successfully with a young infant, we must tap our own reservoir of body- based knowledge, our own abilities to see subtle changes in behavior, to touch lightly, firmly, warmly, quickly or slowly; to feel with our hands and bodies; to sense "intuitively" when there is well-being and when there is danger; to move him, or to move ourselves in certain ways when he is in our arms; to modulate and adapt our voices and patterns of speech to ones he understands more clearly. In short, while all the while he is growing and developing and becoming more like us, we have to adapt and become more like him: he requires of us to join him in his reality of sensing, feeling and

thinking through the tissues of the body.

Construction of the infant self

> **" We are trapped so long as we imagine that the newborn must either be completely equipped with emotions and cognition, or else no person exists. As long as the neonate has enough sense to know pleasure , pain, ...[and]... "a bodily sense of me," then he or she is a person, and that implies being born into selfhood." A. Efron, 1985**
>
> **"[the self is] something that exists in some form from birth to death." D. Stern, 1985**
>
> **"...we cannot acknowledge any psychological identity with our past self. It has vanished like the snows of yesteryear." T. Reik, 1964 (p. 298)**

An exploration of the early human self is of great importance because it is this construct which allows us to consider the infant's subjective experience and therefore his humanity and his personhood, from the very beginning. Specifically, a focus on the self is crucial for clinicians involved in early intervention efforts with neonates: if the intervention has at its goal the optimal development of an infant's organizational capacities, then in order to facilitate that organization we must try to grasp the infant's subjective experiences of himself and events around him.

What is it that we mean by "self" in the first two to three months of a human being's life? Traditionally, it has not been possible to speak about a self during these early weeks, mainly because the psychoanalytic point of view insisted that in the earliest weeks and months the infant occupies a diffuse, undifferentiated, passive, even "autistic" (Mahler, 1975) state. Since he was not thought to be able to differentiate other, we could logically not

think of him as having a self.[3] In the last two decades however, developmental research has forcefully challenged the notion of the passive and wholly undifferentiated infant by carefully observing and documenting a host of early abilities. We now know the infant to be an active, self-organizing and discriminating human being, and these new discoveries of (essentially precognitive) abilities have justified another look into the early self.

Recently, this topic has been given the most direct attention by Daniel Stern (1985, 1990). There are several reasons why Stern's approach seems the most productive in this area. First, the infant's subjective experience and developing senses of self are his theory's central problem and organizing principle. He insists that there are preverbal, precognitive senses of self that provide the basic organization for what is traditionally thought of as a "sense of self." Secondly, Stern skillfully integrates psychoanalytic with developmental approaches in his construction of the infant self. He perceives value in both the "clinical infant" as constructed by psychoanalysts, and introduces him to the "observed infant" as documented by developmental psychologists. This integration is successful, and our understanding of the infant's subjective experience is enriched and amended in line with careful developmental observations. Third, Stern's theory is most appropriate for my present purposes because his goal is to describe the processes of normal development, "normative rather than pathomorphic and prospective rather than retrospective" (p.20). Relatedly, Stern argues convincingly against a developmental stages approach, insisting that the different senses of self

[3] The fundamental philosophical and cultural bias underlying this line of thinking has two aspects: One, it assumes that selfhood is intrinsically defined by separateness and secondly, it assumes that it is cognition, and specifically, representational ability that not only serves to "recognize" selfhood, but in fact creates it. What is implicitly denied in this philosophical framework is the importance and intelligence of physical sensation and experience in infancy, and its pivotal role in forming the earliest self.

established at different point of development in the infant's life remain active and interactive throughout the lifespan of the person.

Daniel Stern's (1985) view of this early self as an experiential rather than a representational construct likens it to the Jamesian (1890) "I," which concerns the self as actor or subject rather than the "Me," the object of one's knowledge. It can also be likened to the "existential" vs. the "categorical" self from the developmental constructivist point of view (Lewis and Brooks-Gunn, 1979). Stern names the earliest sense of self (0 - 2 months) "the emergent self," and explains it in this way:

> It is the organizing subjective experience of whatever it is that will later be verbally referenced as the "self." This organizing, subjective experience is the preverbal, existential counterpart of the objectifiable, self-reflective, verbalizable self. (p.7)

According to Stern, at the heart of the "emergent self" is the infant's experience of "coming-into-being of organization" (p.45), the products of which culminate in the establishment of the "core self," coinciding with the qualitative leap in development associated with the well-documented two month shift (Emde and Buchsbaum, 1989). The task and content of these early weeks consists of the infant's active integration and functional syntheses of his many sensory experiences. The "emergent self" therefore is not, first and foremost product-oriented (such as the attainment of a smooth and integrated hand-to-mouth schema, or attainment of a sense of physical coherence), but heavily process-oriented (for example, the many trial and error movements and various accompanying sensations involved in attaining that same schema and the many integrative experiences contributing to a first sense of coherence). In sum, the "emergent self" is a concept that describes the infant's earliest experience of active, body-based

integrative and organizing processes.

Stern's theoretical framework is a very useful one, especially in that he highlights the experiential, precognitive, process-oriented nature as experienced subjectively by the infant during the first two to three months of life. Also, the significant implications of attributing a sense of self to the very young infant cannot be underestimated - this conceptual leap makes possible ongoing examinations of the young infant's body-based subjective experiences. Yet, in Stern's (1990) Diary of a Baby, a book which has at its goal the fictional recreation of an infant's inner experiences, the infant's physical sensations, specifically as experienced through the modalities of touch and movement, are sadly neglected. In describing the inner life of "Joey at Six Weeks," Stern's focus is almost exclusively on the infant's experiences of vision, and to a lesser degree on inner drives, hearing and spatial awareness and on the affects that accompany the infant's experiences in those realms. Finally, in this chapter we do not get the sense of a baby who experiences the world through his tissues - "Joey" is a baby who experiences the world through his eyes and through his mind. Paradoxically then, while Stern insists on the presence of an early self, in depicting this self he highlights what are considered to be more highly developed cognitive functions such as vision and hearing, circumventing the essential and more "primitive" functions of the body.

Finally, it appears that with the "explosion" of infancy research in the 1960's there has been a trend towards seeing the infant as intrinsically human and at least having an "emerging self," but the justification for this humanization again seems cognitive in essence. That is, because we now know that the infant is not passive or wholly undifferentiated at birth, and

because the healthy infant is able to organize sensory experience and can see and hear and discriminate better than was ever before thought possible, in short, because the infant has now been shown to have a range of essentially precognitive abilities, this is improving his chances for being recognized as a human being and thus worthy of an exploration of his subjective experience. Sadly, just the fact that the infant's body is superbly sensitive to the great many nuances in physical relationship and that he is able to express himself and gather information, this has not been enough to lend him the status of personhood. On the contrary, because the body and its senses are the primary vehicle for information gathering and expression in the early months, his humanity and his ability for selfhood have been repeatedly questioned.

CHAPTER 2

KEY PROCESSES AND PRINCIPLES OF NORMAL DEVELOPMENT, 0-3 MONTHS

"Much nonsense has been written about the behavioural equipment of a human baby during his first months of life...The capacity to learn with which he has been credited varied from virtually none to the equivalent of that of a child of perhaps three years of age....Even during the sixties there was no excuse for these myths." J. Bowlby, 1982 (pp. 268-269)

This chapter will outline and examine several established processes and principles of normal development in the first two to three months of life which will serve as theoretical reference points throughout this work. I believe that these principles and theoretical assumptions are not only a key to understanding normal developmental processes but also provide a sound base from which to comprehend, assess and facilitate normal developmental processes in infants who may be at risk for abnormal development. An understanding of normal developmental processes may be especially significant for the population of substance-exposed infants since, as we will see, there is at the present time no reliable evidence to suggest that intrauterine substance exposure to either opiates and/or cocaine[4] results in neurological compromise or developmental delay: to date, and to the best of our knowledge, the substance-exposed infant is a normal infant who may (and often does) exhibit signs of neurobehavioral disorganization in the neonatal period, presumably as a result of a myriad of factors including intrauterine substance exposure (Lester and Tronick, 1994).

In the next pages I will review and discuss developmental principles for which there is widespread agreement in developmental psychology, all with a special eye toward the infant's subjective experience, the particular significance of the body and the essential interrelatedness of physical experience with other areas of development. I will begin by outlining the transactional nature of developmental processes as articulated by Sameroff

[4] Intrauterine exposure to large amounts of alcohol (identified either as Fetal Alcohol Effects or as the more severe Fetal Alcohol Syndrome) has been researched, and documented effects range from mild dysmorphic features found in children with FAE to mental retardation in approximately 85% of children affected with FAS (Kandall, 1991). While I am well aware of the documented prevalence of polydrug use during pregnancy (Lester and Tronick, 1994), the focus of the present work is primarily on cocaine and opiate exposure, and on the vast majority of polydrug-exposed infants whose primary challenge appears to be neurobehavioral disorganization, not neurological compromise.

(1975), since the ideas contained therein are particularly useful for conceptualizing the dynamic characteristics of the developmental process for both normal and at-risk infants, within their respective contexts. I will then go on to discuss the "Two Month Shift" (Emde and Buchsbaum, 1989), a well documented qualitative and quantitative shift in development at 2 - 3 months of age, which delineates the boundaries of the present inquiry. With the above as backdrop, some of the main developmental processes and events of the neonatal period and the first two to three months of life will be reviewed and examined.

Throughout, this chapter will highlight the proposition that particularly in the first months of life, the infant's body is the primary vessel and vehicle for sensori-motor, emotional, cognitive and social communication and expression. I will discuss the principle that the infant is an active and interactive participant in his own development, with a main focus on early cognitive development and the work of Jean Piaget (1952). This is followed by a detailed look at the concept of early neurobehavioral organization and the application of the organizational model (Brazelton, 1989, Als, 1979, 1982) to this early period of development, including a description and discussion of the infant's emerging organization in the autonomic, motor, state, attentional and interactive realms. It will be proposed that his overall functioning is a direct reflection of his organizational and integrative abilities.

The Transactional Model: Arnold Sameroff

> **"...development becomes the outcome of relationships between interacting individuals at every phase of life." Sameroff, 1993 (p. 4)**

A key concept on which there is general agreement in current developmental theory concerns the transactional nature of the developmental process. Broadly put, Sameroff's (1975, 1993) theory embodies a perspective that emphasizes the dynamic, multidirectional and continually adapting forces in development between a subject and his environment. This perspective is significant for theories of normal development as well as in regard to our view of children with early vulnerabilities.

As part of large-scale efforts to discover the long-term outcomes of infants born at biological risk, Sameroff (1975, 1993) proposed that it is essential to take into account not only the effects of constitutional/biological factors or social/environmental factors on developmental outcome, but to examine both, and in the light of individual differences and individual contributions to differing situations. That is, Sameroff argues that while developmental outcome is perhaps most strongly influenced by the ability of the caregiving environment to respond in an individualized, adaptive and dynamic manner to the child, the individual characteristics of a child also assume great importance. That is, the child does not react passively or predictably to environmental occurrences, but initiates and responds in an active and individualized manner. In short, not only does the environment influence and shape the child, but the child also influences his environment, and contributes to his own development.

Sameroff's (1975, 1993) theory underscores the plastic character of the child and his environment, and highlights the potential for changes and adaptations in relationships, and thus also the potential for differential developmental outcomes over time. Like Piaget (1952), Sameroff views the child as an active and interactive participant in his own development, who is

able to organize and flexibly re-organize his experience. In addition, he holds that each infant possesses "self-righting" and "self-organizing" tendencies, which serve to maximize the potential for normal development. In his own words, Sameroff (1975) states that,

> Evolution appears to have built into the human organism regulative mechanisms to produce normal developmental outcomes under all but the most adverse of circumstances....[There exists a] self-righting and self-organizing tendency, which appears to move children toward normality in the face of pressure toward deviation. (p.21)

In this view, the infant is not only active, interactive and able to organize his experience, but it is believed that his organizational processes are fundamentally adaptive, oriented towards survival and towards ensuring maximal normalcy in development.

The transactional model has implications for the development of "normal" babies and for theories of normal development, as well as for infants at biological or environmental risk. In regard to both "normal" and "at-risk" populations, this theory reminds us that developmental outcome cannot be predicted, and that the developmental path is determined and shaped by a multitude of factors, above and beyond early vulnerability or risk status. While a baby may be born with no biological risk factors, his development may nonetheless be impeded by his environment, by his particular temperamental impact on his environment, or by a combination of both. Conversely, a baby with a biological vulnerability at birth is not "guaranteed" a future of disability or delay. A supportive and responsive environment, a "good fit" of the child's temperamental or other qualities with his environment, or a combination of these factors may very well produce normal developmental outcomes.

The "Two Month Shift:" Qualitative Reorganization

> **"It seemed like a new awakening. Taking a lead from the feelings expressed by many of the parents in our study, we often imagined this shift as a 'human rebirth.'" Emde, Gaensbauer and Harmon, 1976 (p.90)**

> **"The age of two months is almost as clear a boundary as birth itself." Stern, 1985 (p.37)**

The focus of the present work is an examination of the development of the infant in the first two to three months of life. The two to three month marker is not an arbitrary one: parents, researchers and clinicians alike point to qualitative differences in infants' behaviors before and after this time. I begin by delineating this "two month shift" so as to better frame and contextualize our discussion concerning normal development in the first weeks of life.

In the last two decades, major breakthroughs in developmental research on young infants, together with new discoveries in the neurosciences have resulted in the debunking of the model of the young infant as a passive, wholly undifferentiated and helpless creature, driven to seek stimulus primarily by his need for food, and replaced it with a model of an active, stimulus-seeking, organized and self-organizing young human, who participates creatively and in an individualized[5] way in his own development. An important aspect of this organizational model as pertaining to early infancy was the understanding, again supported both by developmental research and by data from the neurosciences, that early development does not seem to be continuous in a simple way but is instead

[5] To understand the infant as an active human subject is to acknowledge the individual way in which this subject perceives, responds to and affects his environment. Although this will not be explored in depth in the present work, individual differences in infants have been documented by research to date (Thomas and Chess, 1977, Escalona, 1976).

punctuated by a series of biobehavioral shifts in organization, marked by apparently sudden qualitative leaps in behaviors and abilities (Emde and Buchsbaum, 1989).

In normal development, the period between two and three months of life marks one of these biobehavioral shifts in development. The "Two Month Shift" has been described as a shift in perceptual organization, after which time " behavior cannot easily be accounted for by endogenous rhythms and internal state." (Emde and Buchsbaum, 1989, p.200). Broadly put, this shift signifies a change of the focus of the infant's behavioral organization from endogenous to exogenous control. For example, endogenous developmental achievements such as the attainment of physiological homeostasis, self-regulation, and basic integration of primitive reflexes make way to tasks which are more exogenous in nature such as changes and expansions in the infant's abilities for social interaction, dramatically seen in the social smile and in the onset of cooing. After two months of life, the infant begins to have longer active and quiet alert states, including more "prominent eye to eye contact," (Emde and Buchsbaum, 1989, p.203) with caregivers[6] . His sleep behavior typically also changes quite dramatically, showing a decline in undifferentiated REM states, an increase of longer sleep periods and a "settling" into diurnal patterns (Emde and Buchsbaum, 1989). In addition, during this time, many of the early primitive reflexes have become functionally integrated and the infant's movements appear smoother, more controlled and functional.

Daniel Stern (1985) draws our attention to the probability that along

[6] Strayer (1986) comments that at about eight weeks of age, the infant's "staring" changes into a "more human kind of looking." (p.598). Here again we see an example of the "dehumanization" of the infant prior to the advent of the two month shift.

with this behavioral shift comes a change in the infant's subjective experience, resulting in qualitatively new responses from the infant's caretakers as well. He writes,

> One is suddenly dealing with an altered person. And what is different about the infant is not simply a new batch of behaviors and abilities; the infant suddenly has an additional "presence" and a different social "feel" that is more than the sum of the many newly acquired behaviors and capacities.. Stern (1985), (p.8-9)

More explicitly, Stern (1985) states that the infant's altered sense of self "...make[s] us act differently and think about the infant differently...(p.8-9), and while arguing against the notion that "the infant is generally thought to occupy some presocial, precognitive, preorganized life phase that stretches from birth to two months..(p.37)," he nonetheless finds that "the age of two months is almost as clear a boundary as birth itself (p.37)." Emde, Gaensbauer and Harmon (1976) similarly compare this shift to a "human rebirth," and Emde and Buchsbaum (1989) echo Stern's observations regarding a qualitative shift in the response of caregivers around this time:

> ... an often-heard comment, especially by parents of a firstborn, is that now their baby is human rather than a doll-like object to be protected and taken care of... (p.200)

In sum, and as discussed in Chapter 1, the various biobehavioral changes associated with the two month shift in development seem quite suddenly to transform the infant from a "squirming, crying creature" (Anisfeld, 1984) into a small person who can make us feel recognized and loved with his infectious, joyous smile. Thus, while this developmental leap is certainly an important marker in early infant development, it seems also to constitute a significant event in the evolving perceptions of caregivers,

researchers and clinicians.

If the two month shift is perceived as the social "birth" of a "human," then how do we conceptualize the nature of the infant and his development prior to this event? What do we know of the earliest developmental processes? How does the infant experience himself and his environment before this biobehavioral shift in development? What does his behavioral organization consist of in the first two to three months of life? What are some of the infant's developmental tasks, abilities and challenges that form the basis for his developmental leap into the exogenous realm? These questions form the basis for this chapter's explorations.

The Active Infant

> **"Action is the point of departure for intelligence." Jean Ayres, 1972 (p.5)**
>
> **"...infants are fundamentally active, socially interactive, and organized. Infants are stimulus seeking and participate creatively in their own development." R. Emde, H. Buchsbaum, 1989 (p.199)**

One major tenet in current developmental research and practice is that the infant is from the very beginning an active participant in his own development. This principle was conceptualized and demonstrated most clearly by Jean Piaget (1952), an epistemologist whose primary interest was in the development of the infant's active construction of intelligent action. Piaget conceptualized the first two years of life as the period of sensori-motor development, so called because it is the infant's bodily sensations and in turn his motor acts that are his primary tools for engaging with and learning about the environment. This period of sensori-motor development is

conceptualized to consist of six substages, each of which chart the developmental course of the infant's relationship between the world of his self and the world of objects. Broadly speaking, in these stages Piaget describes the infant's development from his "solipsistic" beginning to a recognition of self, of other and of an independent object world.

The first two to three months of life encompass substage one and part of substage 2 of the Piagetian framework, in which reflexes consolidate and gradually move beyond their rigid early nature, beginning to contribute to more purposeful action. At this point in the infant's development, he does not possess representational abilities to inform his world and activities; rather, the infant experiences, processes and acts based solely on his sensorimotor experiences. As Anisfeld (1984) puts it,

> ...infants have no experience of independent objects, only of their own sensations and reactions to objects....Infants experience only sensorimotor actions, not things. (p.22)

Central to Piaget's model of the infant's active construction of his world are the concepts of schema, assimilation and accommodation (Piaget, 1952). In the first two to three months of life, the infant's reflexes are his first schemes. That is, they are entities of activity, kinds of action patterns that are strengthened, expanded and transformed by the processes of assimilation and accommodation. Broadly put, an infant takes in external stimulus and assimilates this information to his existing schema. This is one way he widens his familiarity with the outside world and this assimilatory action in turn strengthens his existing schema. On the other hand, when the infant encounters external stimuli that is different from the existing schema in such a way that it cannot be assimilated, the infant must accommodate his schema

in order to process stimuli.[7] Along these lines, it appears that the external stimuli must have just the right combination of familiarity and novelty for accommodation to occur at a given developmental level. If it is too novel or different from the existing schemes, the infant cannot accommodate, and if it is too similar to the existing schema, there is no need for the infant to accommodate and no growth will occur. In sum, according to Piaget's theory it is the combined mechanisms of assimilation and accommodation that constitute the infant's active participation in his own development and in the first two to three months of life it is the reflexes that are the infant's primary schemes.

Finally, the principle which conceptualizes the infant as active in constructing his own development is significant because it alerts us to the fact that the very young infant is equipped to learn and to begin to organize his various experiences, and that he is a participant in his developmental process, rather than the passive recipient of environmental input.[8,9] Also, Piaget's

[7] For example, let us look at the infant's ability to suck, a reflex already established in-utero: The infant is able to assimilate many objects to his sucking pattern - first his own thumb, then perhaps other fingers, his mother's fingers or nipple, a pacifier. Through his sucking actions, applied similarly to a variety of objects, he gathers information about his environment, as well as strengthening his sucking schema. This is what is meant by assimilation. On the other hand, throughout the course of his waking time, this same infant will encounter objects where his primitive sucking schema is not successful: the edge of a woolly blanket, a caregiver's shirt, the buckle on a baby carrier. At first the infant will try to apply his schema onto these objects, but when he is not successful, he will adapt his schema to these new circumstances: perhaps he will cease to suck, perhaps he will modify the manner of his sucking, or perhaps he will begin to mobilize other parts of his body in order to integrate this new object into his expanding repertoire. This is what is meant by accommodation.

[8] Piaget emphasizes the infant's active and stimulus-seeking nature in the realm of the development of cognition and particularly his relationship to the object world, but as we will see, this concept is not limited to the realm of cognition and operates powerfully also in the child's relationships with the social world.

[9] As we will see in Chapter 5, this principle is also key in carrying out clinical interventions with behaviorally disorganized young infants: if the infant is perceived as an active participant in his own development, interventions must be designed to encourage and make use of that activity in the therapeutic process.

model reminds us that for the very young infant, the various strands of development are intricately intertwined. For example, cognitive development, an area of development that tends to represented in a somewhat "disembodied" way, is in its origins deeply steeped in physical sensation and action. At least prior to the ability for representation, it appears to be the physical body that feels, acts, "thinks," and organizes.

Neurobehavioral Organization, 0-3 months

> **"Newborns are often described as creatures who only eat, sleep and cry" J. F. Rosenblith, et. al., 1985, (p.207)**

An organism's neurobehavioral organization can be seen as a reflection of that organism's present and potential abilities and limitations, and as a collection of the tools available to that being in his management of himself and of his interactions with his environment. In a sense, to understand the young infant's behavioral organization is to be able to understand his early, body based "language."

The "explosion" in infancy research in the last two decades, along with the recently intensified efforts to better assess and provide developmental intervention to very young infants have spawned sophisticated theory and assessment techniques that synthesize previous knowledge and newly conceptualize the neurobehavioral organization of the infant in the earliest months of life. Perhaps most prominent in this regard is the work of T. Berry Brazelton (1989) and his development of the Brazelton Neonatal Behavioral Assessment Scale (BNBAS). The BNBAS is a neurological assessment that can be used with newborns up to approximately four weeks of age, and allows clinicians to observe and assess individual neonates' behavioral organization

in a detailed, interactive manner. Central to this assessment is the close observation of the infant's state behavior, his ability to shut out as well as move towards stimuli, his manner of interacting with caregivers and his abilities for self regulation.

In addition to Brazelton's work, the writings of Heideliese Als (1979, 1982), and especially her formulations of a "Synactive Theory of Development" are quickly gaining recognition.[10] Als' organizational model is strongly influenced by the science of human ethology and by an evolutionary, biological perspective that views humans as organisms who are programmed to fulfill those species-specific biological needs that will ensure survival.

The theories of both Brazelton (1989) and Als (1979, 1982) envision the very young infant's behavior as a reflection of the continuously interacting and simultaneously functioning (thus synactive) activities of four behavioral subsystems: the autonomic system, the motor system, the state system and the attentional-interactive system (Als, 1982). Even though these subsystems are continuously interacting, they are conceptualized in a hierarchical manner: that is, the infant's management of the autonomic system underlies his functioning in the motor system, the management of his movements and of his basic homeostatic activities underlie his behavior in the realm of state, and his use of state in turn strongly affects his abilities in the attentional-interactive realm. Als (1979) states it in this way:

> ...a model has been derived of hierarchically organized subsystem differentiation and regulation, where all subsystems are in continuous feedback and interaction with each other, and where the organization of one subsystem results in compact,

[10] Also, Als' development of a scale for the Assessment of Preterm Infants' Behavior (APIB), an assessment based in large part on the BNBAS, but revised and expanded especially to apply to preterm infant's organizational abilities, is beginning to be utilized in developmentally progressive and family centered NICU's across the country.

> efficient functioning which frees the total system to expand the differentiation of another subsystem. Als, 1979 (pp 25-26)

Further, the infant's neurobehavioral organization does not occur in a vacuum. His continuously expanding and differentiating abilities take place in the context of his environment and in relation to his caretaker, who engages in "mutual regulation" (Als, 1979) with the infant. Perhaps not dissimilar from Winnicott's (1965) concept of the "holding environment", Als (1979) speaks of the infant's relationship with his caretaker as the "matrix" in which neurobehavioral organization takes place, and as the "envelope of reciprocal regulation and mutual influence. (p.31)" What follows is a description and discussion of each of the subsystems that are thought to make up neonatal behavioral organization.

The Autonomic System

This system refers to all activities associated with physiological regulation and the autonomic functions of the nervous system. Als (1982) has described this system as being responsible for "the organism's basic functioning (p.234)". Organization in this realm sets the baseline for survival and well being on its most primitive level. Included in this behavioral subsystem are physiological tasks such as temperature regulation, respiratory functioning and digestion. The integrity of the autonomic system can also be observed in color changes of the skin and in the presence of behaviors such as hiccoughing, sneezing, yawning, gagging, spitting up and sighing. Startles, twitches and tremors also are behaviors associated with autonomic functioning. In the first weeks of life, the attainment of autonomic regulation and the achievement of physiological homeostasis are

main tasks of the organism and appear to underlie and support other emerging developmental tasks.[11] In normal development, the autonomic system stabilizes rather quickly and the organism is characterized by its smooth functioning.

Although stress signals such as startles, tremors and spitting up appear to some degree in every young infant, it appears that it is the degree to which they are present and deter from the other developmental tasks of the organism that determines their "normalcy." As we will see in greater detail later on, both cocaine- and opiate-exposed infants have been clinically observed to manifest difficulties in this realm. For example, in infants going through opiate withdrawal, irregular breathing, temperature elevations and excessive sweating, sneezing, yawning, startles and tremors have all been observed. Infants exposed to cocaine often present clinically in a "depleted" manner, and tremors and startles are quite common. Seizures have also been documented to occur at a greater frequency in opiate-exposed infants (Kandall, 1991). It is reasonable to suppose that disorganization in the autonomic realm has, as its consequence, a continual preoccupation with achieving or regaining homeostasis, and therefore a limited ability to attend to the outside world[12].

[11]This point in particular is one on which there appears to be much agreement. For example, Greenspan (1992), in his conceptualization of early ego development refers to this early time a period of "homeostasis." Also, Margaret Mahler (1975), while conceptualizing these first weeks of life in a much different way than most current developmental theorists, nevertheless stated that "[t]he task of the autistic phase is the achievement of homeostatic equilibrium of the organism within the new extramural environment, by predominantly somatopsychic..., physiological mechanisms (p.43)," and that "the function of this period is best seen in physiological terms (p.41)."

[12] In my own work, a striking example of this was that of a seven week old, polydrug-exposed infant who was not able to track a red ball in an horizontal arc. Each time his eyes focused on the ball and he began to follow its movements, he was disturbed by autonomic symptoms such as gastrointestinal cramps and hiccups. Eventually, this infant averted his gaze and ceased to interact in this activity.

The infant's caretakers as well as the physical environment play an important role in the successful organization in this realm. As mentioned, even a normally developing infant occasionally presents with stressed autonomic symptoms. A "colicky" baby is a good example of this. However, when an infant's cues are recognized promptly and accurately, a great deal is normally (and often unconsciously) done by parents to help the infant stabilize. For example, an infant who is breathing irregularly or quickly can be held snugly against the mother's body, and her regular, rhythmic breathing can help the infant modulate his own. If an infant startles easily, the parent will reduce sudden loud noises in the environment, and will take extra care to move the infant in a slow, predictable fashion.

As we will see in later chapters, a substance-exposed infant who exhibits behavioral disorganization in this realm is vulnerable due to his physiologic status and may require more intensive help than a normally developing infant in order to achieve homeostasis. However, potential risk factors such as lack of personalized and consistent caregiving, repeated failures to respond promptly to his cues, as well as the environmental stressors inherent to an intensive-care hospital setting may create a situation for the infant where his symptoms may actually be exacerbated by his context.

The Motor System

> **"Despite its central theoretical importance, the study of motor development in infants and children had long been in the backwater of the discipline of developmental psychology." Lockman, Thelen, 1993 (p.953)**

Broadly speaking, the organization of the motor system represents the

infant's evolving relationship with gravity[13], influenced and modulated by his environment through handling, touch and by caregivers' responses to the infant's behavioral cues. A description of the young infant's motor system entails a basic understanding of several interrelated key concepts including the development and role of normal postural tone, the function of the primitive reflexes, and physiological flexion and the development of extension. It is the interrelated development of these components that constitutes integrated early movement in the first two to three months of life.

Basic Postural Tone: Definitions and Characteristics

An understanding of basic postural tone[14] is key to an understanding of movement and sensori-motor development. While this is a concept that is usually discussed in a context of abnormal or pathological functioning - such as the "spasticity" (very high tone) or "flaccidity" (low tone) seen in persons affected by cerebral palsy and other disorders - the concept of muscle tone is central to an understanding of the normal development of movement skills. While a complete theoretical understanding of muscle tone is yet to be

[13] While this may appear obvious, I believe that the significance of this point is often not appreciated and/or articulated. While most would readily acknowledge that one of the key developmental tasks in the first few years of a child's life is to develop increasingly sophisticated attachment relationships with his caregivers, his primary relationship and need for competence in regard to the gravitational force, or with "mother earth," is usually not examined with similar attention and care.

[14] Basic postural tone is commonly also referred to as 'muscle tone', or just simply as 'tone'. "Flexor tone" refers to the state and activation of flexor muscles, mostly located in the front of the body and "extensor tone" refers to the state and activation of the extensor muscles, mostly located in the back of the body.

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developed[15], the field has emerged with some working definitions. A classic, and I believe, useful definition as articulated by Bainbridge-Cohen (1993) holds that,

> Postural tone is the background activity of muscles before a contraction takes place and the baseline of muscular tension from which a contraction occurs, expressing the readiness of a muscle to respond or relate. (p.125)

Simply put, muscle tone can be understood as our 'readiness to move' at any given moment; this in turn is related to our functional relationship to gravity, and it is thought to be determined by a combination of genetic and maturational factors, and further influenced by the immediate environment (Bainbridge-Cohen, 1993)[16]. Bainbridge-Cohen (1993) writes that muscle tone is:

> "...modified by the way we are related to physically, perceptually and emotionally. Tone is relative and is reflective of the interaction between one's inner and outer environment." (p.125)

In sum, while muscle tone is to a great degree constitutional, it should be considered that it is also reflective of the infants's experience with his immediate environment. The ability of muscle tone to be influenced by touch, handling and emotional interaction carries important implications for intervention with at-risk infants, and will be explored in greater depth in

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[15] Within the last two years, a renewed interest in motor development and sensori-motor processes has surfaced, and its discoveries will perhaps change some of the assumptions and theories that are reviewed in this section (See Somerville, 1993)

[16] A yet largely unexplored but particularly interesting area of study has to do with the emotional components of muscle tone. In clinical work with young infants, tonal responses appear to be closely tied to emotional ones. For example, an infant who is crying loudly and clearly in some sort of emotional distress will exhibit an increase in muscle tone and when comforted will, in turn, exhibit a decrease in tonal activation. On the other hand, some infants appear to respond to stress with deactivation, "tuning out," and a subsequent decrease in muscle tone. A confounding issue in this regard is that these tonal changes are often not *visible*, but *palpable*. That is, perhaps we can ascertain how the infant feels by how he "feels to us," and perhaps only in this way. These questions will be explored in greater depth in Chapter 5.

Chapter 5.

Muscle tone exists on a continuum from flaccidity to spasticity, and what is considered to be "normal tone" exists on a continuum as well. For example, infants with normal motor functioning may display different tonal responses to the same sensory input: while infant "A" may react with a vigorous grasp and an activation of his entire body to a finger placed in his palm, infant "B" may respond more slowly, or with a weaker grasp or with little or no associated reactions. While both responses are likely to be appropriate and normal, they are different and they are indicative of differing tonal organization. In addition, it is characteristic of normal sensori-motor organization that muscle tone does not remain static, changing depending on activity level. For example, infant "A" will display higher tone when awake and active, and a lowering of tone when finishing a feeding or when asleep; he will activate his tone to meet an external challenge, and decrease his tone when returning to rest. The same processes hold true for infant "B." However, the difference between the two infants in this regard is that the 'baseline' tone of infant "A" is higher than that of infant "B," though both are within the normal range, and there is no indication that one pattern is superior to the other [17].

In sum, muscle tone can be understood as a reflection of our functional relationship with gravity. High or increased tone could be defined as a motoric overcompensation to the pull of gravity, low or decreased tone could be defined as a lack of ability to overcome the earth's gravitational pull, and in this same way, normal tonal organization could be understood as a

[17] While here we are mainly concerned with the development of infants, these principles apply to children and adults as well. Children and adults with normal motor organization and abilities are somewhere within normal limits on the continuum of tone. While some activate tone more quickly, others do the same more slowly.

functional relationship to gravity that includes the abilities to both bond and release into the earth (as we do during deep resting states), the ability to activate and maintain anti-gravity positions (as we do on a daily basis in walking, sitting, reaching, etc.), and to transition voluntarily and smoothly between these necessary movement options.

Physiological Flexion

> **"At birth a normal full-term baby is dominated by flexor tone. Over a period of ten to twelve months, extensor tone has developed, flexor tone has strengthened, and a balance has been created to allow for coordinated patterns of movement from gross to skill." M. Fiorentino, 1981 (p.26)**

Broadly speaking, every coordinated movement requires either flexion or extension, usually a combination of both, and always a modulation of one by the other. For example, a "simple" movement such as standing up from sitting in a chair requires first increased flexion at the ankle and hip joints, followed by extension first at the knee and then at the hip joints, as well as extension of the spine until standing[18]. This and a host of other "simple," everyday movement tasks require the full development of 1) the ability to flex and extend different body parts in an individuated and controlled manner, and 2) relatedly, the modulation, (or balance) of flexor and extensor tone throughout this dynamic process[19]. At birth, infants are not capable of

[18] This movement pattern can take many different forms and can be performed within a wide range of efficiency, and is usually accompanied by many other small and less essential movements, also composed of the components of flexion and extension.

[19] A lack of modulation can easily be observed in children who exhibit increased extensor tone in the shoulder girdle and spine, presenting with excessive spinal extension and retracted shoulders. In this case, flexor and extensor tone are not balanced. However, one cannot assume automatically that extensor tone is too strong, but must also consider the likelihood that flexor tone is too weak.

either of these tasks - at this time and throughout the next weeks, motoric behavior is characterized by whole body movements and by the presence and dominance of physiological flexion.

Physiological flexion is a pattern of total body flexion and develops in the fetus during the last trimester of pregnancy. As the fetus grows, intrauterine space becomes scarce, and he is forced into an increasingly curled, flexed position. As he is already a fairly active mover, he pushes against the uterine wall and the uterine wall responds in a flexible way. Thus biological development, increasing limitations of intrauterine space, and movements of both fetus and uterine wall produce the normal early state of physiological flexion. This is the normal muscular state for the newborn, and it serves as the baseline for all future movement development (Bainbridge-Cohen, 1993, Fiorentino, 1981, Connor, Williamson, Siepp, 1978).

In the first weeks of life, extensor tone develops rapidly and begins to be modulated (balanced) with physiological flexion, making possible increasingly controlled and organized movements. Through the function of the primitive reflexes and related movement patterns, flexor and extensor tone are usually differentiated and integrated at about six months, when the baby can be observed to be able to lift his head against gravity in the prone position[20,21] .

The Primitive Reflexes: "Alphabet of Movement"

"Reflexes create the pathways that allow the Mind to express

[20] I am here referring to the Landau reaction, more commonly known as the "airplane position."

[21] Since physiological flexion develops in the last trimester of pregnancy, many premature infants have not developed sufficient flexor tone. Thus, as extension begins to develop it is not properly modulated by flexion, and this results in sensori-motor disorganization (often visible in excessive extensor patterns) in premature infants. It is in order to stimulate the development of flexor tone that most therapists prefer prone positioning for these babies.

itself in movement. They establish basic gross patterns of function that utilize and underlie all movements. They are the alphabet of movement and build and combine together to create more varied patterns of movement." Bainbridge-Cohen, 1993 (p. 124)

The primitive reflexes are automatic, involuntary, patterned and predictable movement responses, elicited by specific stimuli (Fiorentino, 1981). They appear before birth, are particularly active in the neonatal period, and normally become integrated into increasingly complex and voluntary movement patterns by four to six months of age (Bainbridge-Cohen, 1993). The primitive reflexes are thought to create the earliest neurological pathways for movement, and their normal development is inseparable from the development of muscle tone and later coordinated, efficient movement. Fiorentino (1981) writes that,

> The neonatal, primitive and postural reflexes interact and integrate to form the background of normal, voluntary movements and skills....Without their full development and integration, normal tone, distribution, and normal activities might not be realized or might be delayed or compromised." (p. 28)

In our previous discussion of early cognitive development, we saw how the reflexes are the first building blocks of active learning, the infant's first schemes (Piaget, 1952). In addition, a key characteristic of the reflexes is that they function to ensure the organism's basic survival (Ayres, 1979), and I have found it useful to group and organize them with their survival value in mind[22] . For example, rooting, sucking and swallowing are three of the primary reflexes utilized for feeding; grasp reflexes are used for clinging and

[22] **The present organization of the reflexes according to their survival value is loosely adapted from Bainbridge-Cohen's (1993) conceptualizations. See "The Alphabet of Movement," Parts I and II in Sensing, Feeling and Action.**

ensuring warmth and physical proximity, and flexor withdrawal and extensor thrust are reflexes that serve to offer primitive protection against noxious stimuli. The hand-to-mouth and the asymmetrical tonic neck reflexes may function to set up primitive spatial relationships with the self and with space, and the tonic labyrinthine as well as the positive and negative supporting reflexes may set up patterns that allow infants to both bond and move away from the earth.

Neurologically, reflexes are processed primarily in the spinal cord and brain stem (Bainbridge-Cohen, 1993, Fiorentino, 1981) and in a sense, reflex behavior is reflective of the relative health of an infant's nervous system. In a healthy newborn, reflexes occur more or less predictably in response to specific stimulus. For example, if a newborn's cheek is stroked lightly, the newborn will usually turn his head in the direction of the stimulus[23] . There seems to be a qualitative aspect to reflex behavior as well, and in health, reflexes may be characterized by their robust and coordinated response to stimuli.

In sum, normal motor organization in the first weeks of life is characterized by the integrated presence of a host of primitive reflexes that function to ensure the infant's survival. Optimal organization in this area is determined not only by the presence of these reflexes but by their qualitative expression (modulation) and by their rapid integration into primitive functional movement patterns (Bainbridge-Cohen, 1993, Piaget, 1952). Basic postural tone is strongly influenced by the presence and integration of the primitive reflexes (Fiorentino, 1981) and whereas normal muscle tone reflects

[23]However, if a newborn has just finished feeding and is becoming sleepy, he may not root when his cheek is stimulated. This reflex is best elicited with a newborn ready to feed.

an intact nervous system and appropriate gravitational responses, both hyper- and hypotonicity are motoric stress responses that can be a result of neurological insult or a reflection of behavioral disorganization. Finally, the integration of primitive reflexes and basic postural tone is reflected in the quality of the infant's movement patterns. Normal integration will allow for developmentally appropriate processes of differentiation and smooth, coordinated motor responses.

As mentioned earlier, "normalcy" may not be best defined by behavior types, but rather by the degree and persistence of stress signals in a behavioral subsystem. That is, a normally developing infant may have occasional trouble in the coordination of his rooting, sucking and swallowing reflexes and gag or spit up, or his movements may seem temporarily jerky or uncoordinated when stressed. However, this can be viewed as one point on the continuum of the normal infant's experience, which is distinct from a heavily stressed motor subsystem which may consistently and persistently function in a disorganized manner. As we will see in the following chapters, substance-exposed infants may present with a variety of problems in this realm, including disorganized reflexive responses[24] ; high, low or uneven muscle tone; frantic, uncoordinated movements, and a host of feeding difficulties.

As in the other subsystems, the infant's environment plays an important regulatory role in the infant's organizational task of the motor system. As every infant, whether developing normally or not, needs to learn to integrate his primitive reflexes into functional motor patterns, the way in

[24] Opiate-exposed infants going through withdrawal tend to be hyperreflexive, whereas cocaine-exposed infants often present with an exaggeration of some, and a relative absence of other reflexes. An understanding of normal reflex behavior (and of its significance for the development of tone and coordinated, complex patterns of movement) is essential for the observation, assessment and treatment of these early difficulties.

which he is touched and held, carried, moved and presented with tasks will qualitatively shape his learning and integrative processes[25]. For example, the rooting, sucking, swallowing and breathing reflexes become coordinated and integrated through the feeding process. A securely supported infant, positioned well at the breast, given the opportunity to find the nipple through his own rooting efforts and allowed to find his own sucking rhythm will become better organized than a poorly positioned infant who has a nipple thrust in his mouth at the first sign of hunger. In a different vein, an infant who spends much of his time being held or carried closely against a caregiver's body has a greater opportunity for early learning and sensori-motor integration, and may achieve greater balance of muscle tone, smoother movements and better integration of vestibular responses than an infant who spends the better part of his hours lying in a crib. Although the above are examples of somewhat extreme experiences, they illustrate the environment's impact on the infant's developing motor system.

The State System

This sphere of functioning refers to the neonate's level of alertness at a given moment. Especially during the first few weeks of life, and with decreasing but nevertheless potent influence thereafter, state has a powerful impact on the infant's experience, and when observing or assessing his abilities, they must be understood against the backdrop of state. Although the concept of state was initially explored and used by Prechtl and Beintema (1964) and Wolff (1966), Brazelton (1989) synthesized some of this earlier

[25] As I will explore in greater depth in Chapter 5, the quantitative and qualitative aspects of touch seem to have a major influence on the infant's emerging motor organization, and perhaps especially on the earliest significant connections between physical experience, early emotional development, and the "emerging self." (Stern, 1985)

work, and the six states ranging from deep sleep to crying outlined by him have become commonly used and referenced:

> *Deep sleep (State 1).* Regular breathing, eyes closed, spontaneous activity confined to startles and jerky movements at quite regular intervals. Responses to external stimuli are partially inhibited and any response is likely to be delayed. No eye movements, and state changes are less likely after stimuli or startles than in other states.
>
> *Active REM sleep (State 2).* Irregular breathing, sucking movements, eyes closed but rapid eye movements can be detected beneath the closed lids; low activity level, irregular smooth organized movements of extremities and trunk. Startles or startle equivalents as response to external stimuli often with change of state...
>
> *Drowsy (State 3).* Semidozing, eyes may be open or closed, eyelids often fluttering, activity level variable, with interspersed mild startles and slow, smoothly monitored movements of extremities at periodic intervals; reactive to sensory stimuli but with some delay; state change frequently follows stimulation.
>
> *Wide awake (State 4).* Alert bright look; focuses attention on sources of auditory or visual stimuli; motor activity suppressed in order to attend to stimuli. Impinging stimuli break through with a delayed response.
>
> *Active awake (State 5).* Eyes open, considerable motor activity, thrusting movements of extremities, occasional startles set off by activity. Reactive to external stimulation with an increase in startles or motor activity, discrete reactions difficult to distinguish because of general high activity level.
>
> *Crying (State 6).* Intense crying, jerky motor movements, difficult to break through with stimulation. (Brazelton, 1989, pp. 412-413)

It is thought that optimal state behavior of a full term, neurologically healthy neonate is characterized by the availability of the full range of states as well as by functionally adaptive transitions between these states. Put in

another way, organized state behavior seems in this early period to be related to the infant's ability to "make choices," to seek and invite, as well as to shut out stimuli. It can be interpreted to reflect the individual infant's physiological as well as psychological needs for endogenous, inward-turning activity, as well as for more exogenous, outward focused activity, and for all the states of consciousness mediating these "inner" and "outer" places. In the same vein, an individual infant's state behavior can be seen as a reflection of his ability to appropriately self-regulate the kind and amount of rest and stimulation he requires in order to function in an optimal manner.

Als (1982) has identified some state-related stress signals to include "...diffuse sleep or awake states with whimpering sounds, ... strained fussing or crying, ... staring, ... active averting, ... panicked or worried alertness... glassy-eyed, strained alertness..." (p.237). Other signs of disorganized state behavior may be reflected in a limited range of available states, or in rapid state transitions marked by little or no modulation. As will be seen in the next chapters, for both opiate- and cocaine-exposed infants, disturbances in this realm are obvious. Opiate-exposed infants typically spend a great deal of their awake time in an active alert or crying state. We have observed that deep sleep appears difficult to attain, and that transitions between states is rapid. Cocaine-exposed infants, on the other hand, tend to spend a great deal of their time in deep or light sleep states. When disturbed, they will become irritable and enter a crying state, but quickly return to a sleeping state. Both cocaine- and opiate-exposed infants have difficulty attaining appropriate periods of wide awake states, periods of time the neonate uses to gather new information from his environment and to interact actively with his

caregivers[26].

Although neonatal state behavior in general is characterized by the majority of a neonate's time spent in one of the sleep states, and by relatively short periods of wide awake states during the first weeks, important individual differences that may be reflective of temperament have been found, (Brazelton, 1989, Escalona, 1976) and the impact of the environment in influencing state has also been noted: Viewed in a transactional way, the environment and the infant's caregivers influence his state behavior, and he in turn impacts on his environment. For example, an infant on a feeding schedule may be woken during a deep sleep and prodded into a drowsy or wide awake state during the feeding or alternately, feeding a hungry infant found in a crying state may bring him quickly to a drowsy state while feeding. Clearly, an infant's state behavior also impacts strongly on his immediate environment - in a sense, state can be interpreted to signal the infant's emerging "readiness" to relate to the outer world. State disorganization may impact in such a way that a caregiver will feel discouraged or frustrated by an infant who seems always to be difficult to rouse, and once roused does not reach a wide awake state in which he can attend to the caregiver's attempts at visual contact or vocal communication. The caregiver's frustration may be exacerbated if when roused, this same infant immediately begins to cry loudly and when soothed quickly turns inward and into deep sleep once more.

[26] Labile state control appears to be related to the infant's difficulty with processing and organizing internal and external stimulus and with primitive "choice-making." Unpleasant physical symptoms associated with withdrawal or with cocaine neurotoxicity may combine with environmental stimuli to produce an unmanageable combination of sensations. Clinically, it appears that the infant so affected is continually "reacting to" various overwhelming stimuli, and in turn responding with relatively rigid patterns of attention - shutting down or blocking more stimuli either by sleeping or by incessant crying.

The Attentional-Interactive System

This system refers to 1) the infant's capacities for achieving an increasingly differentiated alert state and 2) as a result of this increasing differentiation, the expanding of the infant's social repertoire in interaction with his caregiver. Based on her observations of infants in the first three months of life, Als (1982) writes that "...the differentiation of the attentional-interactive system is the most ... salient agendum of the human organism (p. 231)." It is the full development of this behavioral subsystem that, at two to three months of life constitutes the "two month shift."

It appears that in normal development, the autonomic, motor and state subsystems are managed rather quickly and smoothly by the infant, and that their regulation underlies and supports his abilities for maintaining alertness and for interaction with his social partners. For example, an infant of six or seven weeks can engage in twenty or so minutes of "play" with his parent, maintaining eye contact and following the parent's movements easily, perhaps responding to his parent's vocalizations with a few of his own, changing facial expressions to elicit a response or in response to the parent's actions, and perhaps exhibiting the beginnings of a social smile. The emergence of these interactive abilities are thought to increase in direct relationship to decreasing demands for regulation from the autonomic, state and motor realms.

Conversely, a behaviorally disorganized six to seven week old infant may have trouble achieving an alert state and his interactive skills may be compromised due to disorganization in any of the underlying and supportive subsystems: he may be struggling with digestive problems - constipation or spitting up make him uncomfortable, and this in turn may result in jerky

movements and an increase in muscle tone. The combination of autonomic imbalance and unmodulated tone may cause him to be particularly sleepy or irritable, and this will affect his ability to maintain a wide awake state. Further, the attentional-interactive system relies heavily on the infant's ability to give and respond dynamically to various behavioral cues in interactions with his caregivers, and for a behaviorally disorganized infant this is an inherently difficult task . All these factors combine to contribute to the infant's difficulties in the attentional-interactive realm[27].

As we have discussed in the other behavioral subsystems, here too the environment - and especially the human environment, impacts strongly on the infant's developmental agenda. Parents are especially interested in establishing and maintaining social exchange and interaction with their infants. Their desire to recognize and to be recognized by their babies (Benjamin, 1988) motivates parents to pay close attention to the infant's cues so as to assist the infant to regulate states of arousal (such as bringing a sleepy infant to a more alert state or to calm a fussy infant), to elicit behaviors by cuddling, rocking, touching, visual contact or vocalizations, and to encourage the infant's many initiations - be it a smile, a coo or a gurgle, a movement, a cry or one of many facial expressions. Infant and parent, desiring "mutual recognition" (Benjamin, 1988), find themselves in "mutual regulation "(Als, 1979) with each other.[28] Als (1979) writes that,

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[27] Earlier in this chapter we saw the importance that caregivers attribute to the two month shift, and especially to the feeling of being recognized in a new way by their infant. Disorganization in this realm therefore may impact negatively on the infant's evolving relationship with his caregivers.

[28] Tronick (1989) proposes a "Mutual Regulation Model," which clearly states that an infant's normal development is dependent not only on his ability to self-regulate, but significantly also on the parent's ability to facilitate the infant's self-regulation. Beeghly and Tronick (1994) write that "...it is the quality of the functioning of this dyadic system which determines the child's developmental course. (p.160)"

> ...It...seems warranted to postulate a complex, regulatory feedback system between newborn and caregiver, ready at birth, which launches the complex functioning of the young human organism. The human newborn seems to be set up in such a way that his behaviors facilitate the appropriate responses from the caregiver needed for the potentiation and organization of the system and that they provide opportunities right from the very beginning for individual patterns of negotiation, expansion, and differentiation which depend on both components of the homeostatic feedback system, the caregiver and the infant, and which launch the new member of the species on his path of self-regulation. (p.24)

Or, as Winnicott (1987) stated so simply and eloquently,

> I once risked the remark, 'There is no such thing as a baby" - meaning that if you set out to describe a baby, you will find you are describing a baby and someone. A baby cannot exist alone, but is essentially part of a relationship. (p.88)

Summary of Organizational Model

In sum, the organizational model views the infant as an active and organized young human who has at his task the negotiations and mastery of various developmental agendum in the context of his environmental matrix, which is similarly invested. This model has identified four salient developmental agendas in the first two to three months of life, including autonomic, motor, state and attentional-interactive regulation. The tasks inherent to these four subsystems are viewed in a developmentally hierarchical, mutually supportive and interactive manner.

There are many inherent strengths in this model of neurobehavioral organization. To begin with, to analyze infant behavior in terms of the behavioral subsystems can help organize and clarify the complexity of behaviors that is encountered in the observation of young infants and in

turn, more accurate observation of infant behavior fosters increased sophistication in planning for intervention techniques for infants who present in a disorganized manner. The organizational model as stated by Als (1979, 1982) synthesizes for the researcher as well as for the clinician an understanding of early organizational processes and provides the necessary language to identify their various components.

Another main strength of the organizational model is that it gathers the often distinctly posited and differentially valued aspects of development - cognition, motor development, social development, etc., and accurately synthesizes them into the human whole. In this model, no one component of the infant's developing self is valued as more important than another - instead, Als' (1979, 1982) scientific and detailed approach bears out the essentially intertwined and interdependent nature of the different developmental strands. In fact, it appears that the organizational model is the most sophisticated one to date in which the crucial role of the body (in terms of physiologic as well as motor functioning) is adequately integrated and related with the infant's functioning in other realms. As Als (1979) herself writes, the organizational concept "attempts to encompass the total organism and address the issue of total organism organization." (p.25)

I also think that another great strength of the organizational model is its particular analysis of what goes on in the relationship between an infant and his caregiver. Strongly influenced by the ethological point of view in its analysis of the infant's behavioral organization and the parent's own developmental needs in fulfilling the parental role, this model demonstrates in a new way how the early relationship of mutual regulation between infant and parent is the species-specific, biologically imperative context in which the

human infant becomes organized.

Finally, the organizational model offers an invaluable "grid" with which to understand the early "language" of both the normally developing infant and for the infant at risk, and the role of the environment. However, what of the young infant's developing sense of self, what of his emotions , his subjective experience? It seems to me that while the organizational model does contribute to our understanding of the young infant's subjective experience by detailing his developmental tasks as well as by interpreting his signals, the "organized" infant as presented in this view does not appear to be a sensual, passionate being, and the content and quality of his emotional development remains largely unaddressed.

CHAPTER 3

EARLY EMOTIONAL DEVELOPMENT: "HOLDING" AND SUBJECTIVE EXPERIENCE

"Feeling...is as fundamental in the life of the young infant as is food." M. Ribble, 1965 (p.64)

"...babies are said to cry from loneliness and to have a desire to be picked up. Although to attribute such sentiments to babies in the early months of life is almost certainly not warranted, the statements nevertheless contain more than a grain of truth. When they are not rocked and not spoken to infants are apt to cry; when they are rocked and spoken to they cease crying and are content." J. Bowlby, 1982 (p. 294)

"Since we can never crawl inside an infant's mind, it may seem pointless to imagine what an infant might experience. Yet that is at the heart of what we really want and need to know." D. Stern, 1985 (p.4)

This chapter argues that the infant's early experience cannot be fully understood without an appreciation for his early emotional development. Relying heavily on the theories of Erikson (1960) and Winnicott (1960, 1962, 1963, 1965), this area will be explored with a special focus on the infant's subjective emotional experience and the early significance of the body and physical experience in early emotional development.

In the preceding section we have seen that the young infant's neurobehavioral organizational processes take place in the context of his attachment relationships and the relationship between mother and infant has been discussed as one of "mutual regulation." Whereas the organizational model highlights the developmental and neurobehavioral necessity of attachment from an evolutionarily based, "scientific" perspective, it does not address the more passionate side of this early attachment: what makes up the "feeling life" (Ribble, 1965) of the young infant? As parents, clinicians and researchers it is imperative not only to have an understanding of the infant's neurobehavioral organization, to be able to accurately read the neonate's signals, to appreciate his capacities as well as his limitations, but also to remain receptive to forming an understanding of the infant's subjective emotional experience. What may be some of the key emotional issues the very young infant is negotiating? What role do they play in his "emerging self" (Stern, 1985), how do they express themselves and what is the adult's role and impact on the very young infant's emotional development?

The very young infant's emotional experience: A discussion

It is not a simple task to begin to uncover and attempt to verbalize the infant's subjective emotional experience. Several objections could be raised

at once: it could be asserted that the infant's primitive early organization is not sophisticated enough to produce any kind of "real" feelings,[29] but that even if infants had an active inner feeling life, any statements or conclusions reached in this regard could be no more than adult projections since subjective experience can only be communicated through words, from one subject with representational ability to another.

I agree that it is important to approach this endeavor of attempting to understand the infant's subjective feeling life with some care, and perhaps even caution. As we have seen, the infant's neurobehavioral organization, while impressive in its ability to ensure his survival, is nonetheless primitive and qualitatively different as compared to the neurobehavioral organization of the adult human being. There exist such great differences in developmental goals as well as abilities that it would be foolish to compare the emotional complexities of the adult agenda to that of the infant's. And it is correct that many times, adults project feelings onto infants that may bear little relation to the infant's actual subjective experience of the event: an infant who sucks on the bottle in a quick, slightly unmodulated way is labeled "greedy" by one of his parents, a reflexive facial expression is interpreted to mean that the infant is bored or disappointed, or an infant, crying at many different points during a day is labeled "selfish for wanting all this attention." And these "mistakes" of projection are not only made by parents or other caregivers, but in the theoretical realm as well: In 1952,

[29] René Spitz (1963), who, through his work of showing the disastrous results of early deprivation in infants contributed greatly to improving the environmental and emotional conditions for infants in the Western world, nonetheless echoes many when he states that, "I believe that one cannot speak of emotions in the neonate in the sense in which we speak of them in the adult. At birth one can only speak of excitation." (p.258) Further, Spitz defines the neonate's expressions as "discharge processes," and asserts that "[w]hat is discharged is physiological tension without psychological content." (p. 261)

Melanie Klein writes:

> ...fantasies and feelings of an aggressive and of a gratifying, erotic nature....play a dominant part in the child's early life...Greedy, erotic and destructive fantasies have for their object the inside of the mother's body. In his imagination, the child attacks it, robbing it of everything it contains and eating it up. M. Klein, 1952 (p.36)

It seems that precisely because of the infant's still primitive neurobehavioral organization, his lack of lived experience and representational ability, words and concepts such as "greedy," "selfish," "disappointed," "inside of the mother's body" etc. probably have little relation to his actual feelings or experience. I believe that these "mistakes" of projection are not primarily a result of "reading too much into the infant's behavior," but instead a result of not reading the infant's signals and "language" in an informed manner.

While adult projections and over-interpretations of infant behaviors may clearly not be useful in arriving at a sense of the infant's subjective emotional experience, I think that the opposite approach, one which skirts the issue is equally lacking: to entirely avoid statements regarding the infant's subjective emotional life, and to treat this area of his experience as "unknowable" is to avoid the reality that he is a feeling human being. While it may be correct that infants have no representational ability or words to communicate their inner feelings, anyone who has spent time with a baby (certainly a parent) knows that from birth, infants feel, and feel passionately. In addition, the ideas we hold regarding this question, whether conscious or inarticulate, effect both our clinical and our parenting work. As Stern (1985) puts it,

> What we imagine infant experience to be like shapes our notions of who the infant is. These notions make up our working hypotheses about infancy. As such, they serve as the

> models guiding our clinical concepts about psychopathology: how, why and when it begins. They are the wellspring of ideas for experiments about infants: what do they think and feel? These working theories also determine how we, as parents, respond to our own infants, and ultimately they shape our views of human nature. (p. 4)

In a sense, the approach that takes no position on the infant's inner feeling life makes an error similar to the one that over-interprets the infant's expressions: in neither case does one "listen to" and "speak with" the infant on his own terms, terms which are of the body. While infants do not have words to communicate their feelings, they do have an organized, body based "language" of signals, as explored in Chapter 2. I think that to uncover the infant's emotional experience, we have to listen as well as relearn to speak our common language of the senses and of the body. As most parents know "intuitively," the infant's messages and the content of his feelings come in the form of his respiration, the temperature of his skin, the qualitative "feel" of his muscles, in the coordination of his movements, in the sound of his cry, in the quality of his facial expressions, in his visual behavior and so on. Similarly, our responses come to the infant through the sound of our voice, the feel of our arms and bodies, and through the subtle qualities in our movements and in our touch. And as Stern (1985) has theorized, the young infant is masterful at experiencing "vitality affects," that is, the affective content inherent in the *way* that he is handled, spoken to, etc. It seems to me that the problem of uncovering the infant's emotional experience may not lie so much with the infant's limitations in his ability to communicate, but instead with our own: As adults, our ability to appreciate the infant's subjective emotional experience exists in direct relationship to the awareness, skill and confidence in our physical and emotional perceptions that we bring

to our actions with the very young infant. Our limitations in this regard are not only personal, but cultural. Bainbridge-Cohen (1993) writes,

> As all sciences are reflections of the socio-politico-religious ideas of their time, it is appropriate that the historical repression of bodily sensation in Western Culture has been transmitted as a matter of scientific fact. Within this view, a phenomenon is usually only considered to be "objective scientific fact" if it can be separated from all bodily sensations, i.e., it must be capable of being measured only auditorially and/or visually. If it is measured by bodily sensation, it is considered to be "subjective" and "not scientific. (p.114)

As long as we devalue the physical, sensory realm of experience as a reliable "measurement" of communication and expression, as a crucial addition to our more "cognitive" skills in observing infant signals and behaviors, we will not be able to "hear" what the infant may be "telling" us, or "feel" how he is "touching" us. Perhaps it is not so much a matter of "crawl[ing] inside an infant's mind," as Stern (1985) has said but instead, of crawling inside the infant's body. What clues can we find in the literature in our efforts to uncover what a very young infant feels, and what key emotional issues he may be negotiating?

Erik Erikson: Basic Trust vs. Basic Mistrust

"... emotion is inherently a bodily process." Efron, 1985 (p.67)

In his well-known essay, the "Eight Ages of Man," in which he explored the development and stages of identity formation, Erik Erikson (1960) conceptualized the significance of this early period in terms of the infant's ability to achieve "basic trust." According to Erikson, "basic trust" is the product of the infant's earliest successful interactions of mutual

regulation with his mother. As the infant's primary developmental task is seen to be the attainment of physiological homeostasis, these interactions of mutual regulation concern the infant's body. By responding in a sensitive manner to the infant's needs for affection, food, rest and so on, it is the mother's work and relationship with her infant that enables the infant to achieve homeostasis[30]. The emotional products of this process gone well are, according to Erikson, the infant's ability to experience "a feeling of familiarity (p.247)," as well as "a feeling of inner goodness (p.247)." Significantly, these early experiences are theorized as creating a foundation for the fundamental and lasting "...sense of being 'all right' of being oneself (p.249)." Conversely, this process gone awry is considered to have dire consequences. Erikson writes that,

> In psychopathology the absence of basic trust can best be studied in infantile schizophrenia, while lifelong underlying weakness of such trust is apparent in adult personalities in whom withdrawal into schizoid and depressive states is habitual. The re-establishment of a state of trust has been found to be the basic requirement for therapy in these cases (p.248).

How does the infant express that all is going well in this early stage? It seems that the very young infant expresses his "feeling life" through his body, the vehicle and medium of his day to day experience. Erikson writes: "The first demonstration of social trust in the baby is the ease of his feeding, the depth of his sleep, the relaxation of his bowels. (P. 247)."

Donald Winnicott: Being vs. Annihilation

> **"Is "feeling good"... a physical state or an emotional one? For a small child there is no difference between the two ... throughout**

[30] In a similar vein, Sander (1962) comments that a central issue during the first two and a half months of life "concerns the specific degree of appropriateness that the mother can maintain in her response to the cues the baby gives of his state and needs (p.130)."

the first year, pleasure and displeasure are experienced physically. Physical discomfort is tantamount to emotional misery and pleasant affect is tantamount to physical well-being." Piers and Curry, 1986, (pp.25-26)

"Fundamentally, love expresses itself in physical terms." Winnicott, 1989, (p.89)

Donald Winnicott (1965), a pediatrician and a psychoanalyst from the British school of object relations, devoted a great deal of his writings to the emotional development of the baby within the mother-infant relationship. He outlined both the central tasks of the infant and of the mother during the first weeks and months of the baby's life. While certain aspects of Winnicott's work may seem a bit outdated[31] , I believe that his writings on this topic remain the most theoretically gripping and the most clinically useful. While the thrust of his message is not very different from Erikson's (1960), primarily in that primitive biological needs and the function of maternal care are of supreme importance in the process of identity formation and essentially linked to early emotional development, Winnicott's writings are more complete and detailed.

There are two major components to Winnicott's (1960, 1962, 1963, 1965) theory of infant emotional development and the infant-parent relationship. The first component concerns the infant - his constitutional make-up or "inherited potential," the nature of the ego from birth, and the early developmental processes that take place in the infant's relationship with his mother, whom Winnicott posits as the infant's first "facilitating environment." The second component of Winnicott's theory concerns the

[31] Most notable in this regard is his traditional bias for a nuclear family composed of father, mother and child, and their respective expected roles within economically privileged families of the Western world.

mother - her role with the very young infant, the psychobiological process of "primary maternal preoccupation," and the special nature of what it is that she provides for the very young infant to facilitate his development and emotional well-being. What follows is an outline of Winnicott's theory, with a particular focus on what we can find therein regarding the very young infant's subjective emotional experience.

The "inherited potential" and the "facilitating environment"

Winnicott's infant comes into this world with his constitutional make-up, his "inherited tendencies" or "inherited potential," and at first finds himself in the stage of "absolute dependence." Simply, this means that although the infant arrives with his individual genetic make-up or constitutional potential, he cannot "come into being" without the appropriate initial "facilitating environment" that is provided by his family's (mother's) care. In fact, for Winnicott, the infant's early environment is synonymous with the infant's mother. To restate, although the environment does not determine the constitutional characteristics of the infant, the environment is essential if the infant is to live and develop, and it is through "good enough" mothering that the infant's "inherited potential" can become realized as his "true" or "central self (1960, p.46)."

> Human infants cannot start to *be* except under certain conditions... Infants come into *being* differently according to whether the conditions are favourable or unfavourable. At the same time conditions do not determine the infant's potential. This is inherited, and it is legitimate to study this inherited potential of the individual as a separate issue, ***provided always that it is accepted that the inherited potential of an infant cannot become an infant unless linked to maternal care.*** (p.43)

"Primary Maternal Preoccupation"

Parallel to the infant's stage of "absolute dependence" Winnicott posits the mother's developmental process of "primary maternal preoccupation." He theorizes that beginning in pregnancy, the woman begins a psychobiological process of turning inward, shifting "some of her sense of self on to the baby that is growing within her" (1960, p.53). This turning inward allows the mother to begin to identify with the child, and these feelings of identification continue through pregnancy and into the first few months of the infant's life, producing in her a special kind of "empathy," a kind of intuitive knowledge of what her infant needs, and the desire as well as the ability to adapt to those needs. Winnicott writes,

> I like to give this special state of the mother a special name, because I think its importance is not appreciated. Mothers recover from this state and forget. I call it 'primary maternal preoccupation.' This is not necessarily a good name, but the point is that towards the end of pregnancy and for a few weeks after the birth of a child the mother is preoccupied with (or better, 'given over to') the care of her baby, which at first seems like a part of herself; moreover she is very much identified with the baby and knows quite well what the baby is feeling like...In this way natural provision is made in nature for what the infant needs, which is a high degree of *adaptation* . 1963, (pp.85-86).

Clearly, the quality of the mother's care is of supreme importance to the healthy development and particularly to the emotional well-being of the very young infant.[32] What are the essential needs of the infant and what, in turn are the corresponding crucial aspects of maternal care in the early weeks

[32] As was implied earlier, Winnicott's exclusive focus on the mother as the primary caretaker could be one of the valid criticisms leveled against him. What is so crucial about the mother's role is her ability to identify with the infant, her ability for empathy as well as her desire for adaptation to the infant's needs. Given the successful multitude of diverse parenting arrangements among various cultures and even within the present Western societies, these "maternal" functions may not be at all limited to a biological mother, to a female, or even to a single primary caretaker.

of the infant's life?

"Integration" and "Holding"

During the first few weeks the infant's overarching task is that of "integration," of attaining "what might be called 'unit status.' The individual becomes a person, an individual in his own right" (1960, p.44). According to Winnicott, this process of integration is a psychological as well as a physiological process, a process in which the psyche finds its home in the body, and the infant begins to experience his skin as the membrane that differentiates his self from others.[33] In order for integration and the realization of the infant's "true self" to become a reality, the infant must experience a sense of reliable continuity in his world, a "going-on-being. (1963, p.86)." According to Winnicott, it is the mother's crucial task to ensure her infant's sense of "going-on-being" and she does this by holding the infant, and by providing a "holding environment" for the baby during this time.

Specifically, what is it that is meant by "holding?" For Winnicott (1960), it is a concept that is concrete (as in the actual physical holding of the infant, to which he ascribes supreme importance), and it is a concept that is also used to describe the quality of the infant's environment and all of the infant's care.

> Holding: Protects from physiological insult. Takes account of the infant's skin sensitivity - touch, temperature, auditory sensitivity, visual sensitivity, sensitivity to falling ...It includes the whole routine of care throughout the day and night... Also it follows the minute day-to-day changes belonging to the infant's growth and development, both physical and psychological... Holding includes especially the physical holding of the infant,

[33] In a sense, this aspect of Winnicott's theory is similar to Daniel Stern's (1985). While Stern's work is informed by a great deal of sophisticated infant observational research and thus more detailed and specific in its descriptions of the infants "emerging organization," the infant's task in terms of the development of the self seems to be viewed in an analogous manner.

which is a form of loving. (p.49)

When all goes well, from a psychological standpoint, the essential function of "holding" and of the "holding environment" facilitates the young infant's ability to achieve (ego) integration, to establish an individual and lifelong connection between his body and his feeling life, and through the experience of uninterrupted "going-on-being," to develop the core components of a "true" self. It is important to highlight that while the essence of "holding" is of a physical nature, it functions at the same time in a psychological way. At this earliest stage of development, it seems that the body and the emotions are essentially intertwined, and perhaps even one and the same. The infant experiences and interprets his physical care in an emotional way, and he in turn expresses his emotional development through the messages of his body tissues. In Winnicott's (1965) words: "Love, at this stage, can only be shown in terms of body-care..." (pp. 58)

The very young infant's subjective emotional experience

> **"...it seems clear that it is positive affect that seems to make life worth living for the small infant." Piers and Curry, 1986, (p. 25)**

So far we have focused this discussion on a normal course of development. In the face of "good enough" circumstances, the young infant can experience all that is part of his "coming into being," "emerging organization (Stern, 1975)," or ego integration. What is the experience and what are the developmental consequences of a lack of holding and of a holding environment at this earliest stage? Winnicott's perspective is very clear on this point. In his essay "Ego Integration in Child Development," (1962), he describes the very young infant in this way:

> At the stage which is being discussed it is necessary not to think of the baby as a person who gets hungry, and whose instinctual drives may be met or frustrated, but to think of the baby as an immature being who is all the time ***on the brink of unthinkable anxiety***. Unthinkable anxiety is kept away by [the] vitally important function of the mother at this stage, her capacity...to know what the baby needs in the general management of the body, and therefore of the person. (p.57)

It becomes clear therefore, that a lack of adequate "holding" during this early period of life has extremely negative consequences for the infant's emotional development. In "The Theory of the Parent-Infant Relationship," Winnicott (1960) states quite forcefully:

> ...the alternative to being is reacting, and reacting interrupts being and annihilates. Being and annihilation are the two alternatives. (p47)

Specifically, what might we suppose regarding the subjective content of the experience of the threat of annihilation, of the very young infant's "unthinkable anxiety?" Winnicott (1960) writes,

> Unthinkable anxiety has only a few varieties.....
> 1) Going to pieces
> 2) Falling for ever
> 3) Having no relationship to the body
> 4) Having no orientation
>
> It will be recognized that these are specifically the stuff of the psychotic anxieties... (pp. 58)

Let us take a concrete look at what might constitute a lack of sufficient "holding," an interruption of an infant's need for "going-on-being:" a baby remains lying unattended in his crib. He is hungry and he cries, but no one attends to him. His crying becomes louder and more insistent, his muscles tighten and his movements become faster and uncoordinated. Still no one arrives, no one attends to his needs. The infant has mobilized all that is available to him to draw someone near, but he is not successful. Finally he

quiets or "shuts down" from exhaustion or terror. Taken to an extreme, it is correct to say that were no one to attend to this infant, he would perish. In less extreme form, if neglect, hasty, inconsistent or minimal provisions for the infant's survival are constant factors in his life, the infant, rather than building up a reliable and consistent set or pattern of experiences,[34] will instead be occupied with reacting to and attempting to recover from these caregiving failures.

It appears then, that the early lack of sufficient holding may prematurely force on the infant an experience of extreme powerlessness, an experience that may truly be traumatic. Winnicott (1960) writes,

> ...when things go well the infant has no means of knowing what is being properly provided and what is being prevented. On the other hand it is when things do not go well that the infant becomes aware, not of the failure of maternal care, but of the results, whatever they may be, of that failure; that is to say, the infant becomes aware of reacting to some impingement....such interruptions constitute annihilation, and are evidently associated with pain of psychotic quality and intensity... (p. 52)

In sum, a lack of adequate "holding" in the earliest stage of life produces in the infant a terror akin to experiencing the threat of annihilation, and has major consequences for the young infant's psychic development[35] . Winnicott (1965) postulates that in the early days and weeks of life, the

[34] I believe it is this which most closely correlates with Erikson's (1960) concept of "basic trust."

[35] As will be seen in Chapters 4 and 5, the case of hospitalized, drug-exposed infants may constitute a particularly graphic example of the lack of a good- enough "holding environment" and its associated reactions in the infant. While there is no reason to suppose that the drug-exposed infant's mother does not enter a state of "primary maternal preoccupation" as described by Winnicott, and does not 'love' her infant, extreme stressors in her past and present life may threaten or prevent her ability for providing "a high degree of adaptation" to her infant. The lack of personalized care in a hospital setting may additionally interfere with the creation of a secure "holding environment." To compound matters, the infant may be born with a significant degree of behavioral organization, making effective "holding" not only more imperative, but also far more challenging for the caregiver.

infant's reactions to his "going on being" may be evident in "the aetiology of restlessness, hyperkinesis and inattentiveness (later called inability to concentrate). (1965, p. 61)"[36] The lack of holding may also become evident in infantile schizophrenia, and later in life it may present in the form of personality disorders or other significant emotional disturbance. Finally, perhaps Winnicott's portrayal of the neonate's emotional experience as being either one of "being" or "annihilation" appears quite dramatic. However, when one considers that during this earliest time of life the human organism is primarily occupied with psychobiological survival, this conceptualization begins to correlate quite well with the developmental tasks at hand.

[36] It is of interest that these symptoms are among the many that have been described for drug-exposed infants.

CHAPTER 4

THE SPECIAL SITUATION OF DRUG-EXPOSED INFANTS: MEDICAL EFFECTS, BEHAVIORAL ORGANIZATION AND ENVIRONMENTAL CONSIDERATIONS

Introduction

> **"Drug-exposed infants should not be viewed as a homogenous group but as individual at-risk infants presenting with a broad spectrum of possible effects, ranging from healthy term newborns with no apparent effects to high-risk births with significant effects." TIP manual, 1993**

It has been estimated that somewhere between 100,000 and 375,000 substance-exposed infants are born each year in the United States (Zuckerman and Brown, 1993),[37,38] and it is imperative to recognize that substance-exposed infants are not a homogenous group. The review of the literature suggests that they are not homogenous regarding the type, quantity and timing of intrauterine exposure, and its subsequent effects. We will also see that the mother's general health and reproductive history, lack of economic resources and other stress factors during pregnancy may also play a significant role in determining differential outcomes during the neonatal period. Further, as is true for all infants, and consistent with transactional theories of development (Sameroff, 1975, 1993), the type and quality of the postnatal environment also has a substantial and differential impact on each drug-exposed baby. The

[37] These numbers include exposure to marijuana, but not exposure to alcohol and cigarettes.

[38] It must be stressed that this figure is truly an estimate, since reliable ways of measuring drug-use during pregnancy have not been established or consistently applied. The most common methods of assessing for the pregnant woman's drug use have been through maternal self-report and through the use of infant urine toxicologies. Since the use of most opiates and cocaine is illegal, and since in many states women face the risk of legal prosecution and/or removal of their children from their care once use of an illicit substance is discovered, maternal self-reports cannot be entirely reliable. In addition, as it is known that "denial" and guilt are key features of an addict's psychological make-up, maternal self-report may lack reliability for this reason as well. Although infant urine toxicologies at birth are generally reliable as a marker of maternal substance use in the last days prior to delivery, they are not performed on all infants, and may therefore omit potentially large numbers of babies with intrauterine substance exposure. In fact, it appears that most of what we know about intrauterine substance exposure -both in terms of immediate and long-term effects- comes from poor and predominantly minority women (Lester and Tronick, 1994). As we will see, the additional environmental stressors faced by these women and children become significant confounding variables in attempting to determine both the short and long term effects of intrauterine substance exposure.

environment, and especially its ability to respond adaptively to an individual infant may, in fact, be the key determinant of developmental outcome.[39] Finally, and perhaps most importantly, we should remember that there are individual differences among all infants, and that this implies that each infant brings individual strengths and weaknesses to the process of his development as well as to his interactions with the immediate environment. Therefore, the experience and varying effects of intrauterine substance exposure must not obscure the individual infant, including his own specific risk- and protective factors (Myers et. al., 1992), as well as the processes belonging to the normal developmental path.

The previous chapters are concerned with an examination of several key principles and processes of normal development in the first two to three months of life. As has been stated before, it is an assumption of this work that an understanding of normal development provides a sound base for assessment of and intervention with any at-risk or high-risk infant. In my discussions of developmental processes, early neurobehavioral organization, early emotional development and other areas, my aim was to provide a context from which to view the substance-exposed infant. I concur with the view that holds that the majority of substance-exposed infants are to be viewed as normal infants who may, however, present with special needs, and especially with "disorders of behavioral regulation." (Lester and Tronick, 1994, p.112).

[39] As will be discussed later, at this point in time the developmental outcome of substance-exposed infants is largely unknown. However, there is a general consensus among theorists, researchers and clinicians that it is the ability of the environment to respond to the biologically vulnerable infant in a dynamic and adaptive manner that may be the key determinant of developmental outcome (Lester and Tronick, 1994, Beeghly and Tronick, 1994, Zuckerman and Brown, 1993, Kandall, 1991, Sameroff, 1975).

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At the heart of the present chapter lie the following questions: 1) What are the specific medical and neurobehavioral challenges for substance-exposed[40] infants in the first two to three months of life, and especially in the neonatal period? 2) What is it that is known about the developmental outcomes of these babies, and which key variables, if any, can be identified that seem to be key in determining outcome for these babies? And 3), what are some of the specific environmental challenges for hospitalized drug-exposed infants? It will be seen that our theoretical grasp of the above, combined with our understanding of normal developmental principles, informs and guides early intervention with drug-exposed babies in the medical setting of a Neonatal Intensive Care Unit.

Opiates vs. Cocaine

From both a theoretical and a clinical standpoint, it is important to differentiate between the potential effects of opiates (primarily heroin and methadone) and those of cocaine (including "crack" cocaine). At the same time, it is also important to remember that while the use of opiates or cocaine during pregnancy may have significantly different effects on the infant, the great majority of drug use is polydrug use, including various combinations of opiates, cocaine, alcohol, marijuana, prescription drugs and nicotine (Dixon, 1994, Brooks, et. al. 1994, Beeghly and Tronick, 1994, TIP manual, 1993, Singer, 1993, Kandall, 1991). Further, and as will be explored in more depth at a later point, while we presently have more reliable information regarding the

[40] Although I am well aware that most substance use during pregnancy is in fact polydrug use (Lester and Tronick, 1994), this work will focus primarily on the effects of the opiates and cocaine, and only to a lesser degree on other substances, such as alcohol, prescription drugs, marijuana or cigarettes. Further, this work will focus primarily on the vast majority of substance exposed infants who present with aspects of neurobehavioral disorganization, rather then with indications of neurological damage in the neonatal period.

effects of the opiates than those of cocaine, most of our information on direct drug effects on the infant is questionable, since research on the whole has not been able to adequately control for confounding variables such as broad questions concerning the mother's health (including medical status, nutritional status, presence or absence of prenatal care etc.), the often deleterious effects of her immediate environment (poverty, abuse, isolation) on the course of her pregnancy (Lester and Tronick, 1994, Dixon, 1994, Beeghly and Tronick, 1994, Zuckerman, 1993, TIP manual, 1993, Kandall, 1991).

Effects of intrauterine substance-exposure on the neonate

Opiates, Medical Effects

The main, and generally agreed upon medical effects of maternal opioid use during pregnancy on the infant are reported to include symmetrical intrauterine growth retardation (IUGR), a slight reduction in gestational length, decreased birth weight (mean of 2500 grams for intrauterine heroin exposure, and a reportedly higher mean of 3000 grams for methadone-exposed infants),[41] and a slightly shorter gestational period (mean = 38 weeks) overall (Kandall, 1991). A tendency for smaller head circumference in opiate-exposed infants has also been noted (Zuckerman and Bresnahan, 1991) and premature delivery also remains a risk (Kandall, 1991). Various potential obstetrical effects include spontaneous abortions, abruptio placenta, breech presentation, eclampsia, gestational diabetes and often mild forms of meconium aspiration syndrome (Finnegan and Kandall, 1992, TIP manual, 1993).

[41] However, Lifschitz et. al. (1985) found no differences in birthweight between opioid-exposed infants and control groups when variables of race, prenatal care, weight gain during pregnancy, maternal smoking and maternal education were controlled for.

Again, when considering the above reports, we must do so with caution: it should be considered that these medical effects are most likely not caused solely or even primarily by opioid use during pregnancy, but must be understood in the context of a host of other factors that often affect the pregnant drug-users on whom these studies were based. Finnegan and Kandall (1992) report that medical complications of pregnant addicts include such diverse and serious conditions as anemia, cardiac disease, diabetes mellitus, hepatitis, hypertension, pneumonia, tetanus, tuberculosis and sexually transmitted diseases such as syphilis and AIDS. In the context of poverty and associated stressors, the likelihood of a pregnant addict's poor nutrition and poor prenatal care must also be taken into account. Finally, it is important to note that despite widespread popular belief to the contrary, "...there is no convincing evidence that exposure to narcotics *in utero* results in an increased rate of congenital malformations... (Zuckerman and Brown, 1993, p. 148)," and that "...neither heroin nor methadone has been reported to cause ... a specific dysmorphic syndrome in offspring (Kandall, 1991, p.403)"

Opiates, Neurobehavioral Effects

Various symptoms of narcotic abstinence have been observed and noted since the 1950's (Finnegan and Kandall, 1992), but it was not until the 1980's that a "neonatal abstinence syndrome" (NAS) was described (Finnegan, 1984, 1990). The neonatal abstinence syndrome refers to a grouping of "withdrawal" symptoms experienced by many opiate-exposed infants after birth. Kandall (1991) estimates that approximately 60-80% of infants so

exposed experience withdrawal.[42] The severity and duration of these symptoms vary greatly, and no direct dosage-effect relationship has been established to date.[43] Again, a complex number of factors such as timing and amount of drug, nutritional intake during the pregnancy as well as individual metabolic functions of both mother and infant must be taken into consideration. However, it is generally believed that a larger dosage administered throughout the course of the pregnancy tends to produce more severe withdrawal symptoms in the infant (Zuckerman and Brown, 1993, Kandall, 1991, Finnegan, 1990).[44] When withdrawal is sufficiently severe, pharmacotherapy is required and the neonate is gradually "weaned" from opiate dependence. Zuckerman and Brown (1993) estimate that approximately 40%-50% of heroin-exposed infants, and 70%-90% of methadone exposed infants will require drug treatment.

Generally, symptoms of opiate withdrawal are thought to include many of the infant's body systems including the central nervous system (CNS), the gastrointestinal system, and the respiratory and autonomic systems. Documented CNS symptoms include irritability, hypertonia, hyperreflexia, tremors, high-pitched cries, abnormal suck, disorganized feeding patterns and skin abrasions due to the infant's frantic movements. Disturbed sleep patterns, disordered orientation and poor habituation to

[42] At this time there appears to be general agreement that withdrawal from methadone is more severe than withdrawal from heroin (TIP manual, 1993).

[43] The literature also documents "delayed withdrawal" in infants effected by intrauterine methadone exposure, with abstinence symptoms emerging or worsening between 10-30 days of life . "Subacute withdrawal" is thought to consist of irritability, hypertonia and "poor socialization" and may continue through the sixth month of life (Kandall, 1991).

[44] In addition, Finnegan (1990) states that generally, ..."the closer to delivery a mother takes the drug, the greater the delay of onset of [withdrawal] and the more severe the symptoms." (p.314)

environmental stimuli have also been documented (Zuckerman and Brown, 1993, Zuckerman and Bresnahan, 1991, TIP manual, 1993, Kandall, 1991, Finnegan, 1990, Kaltenbach and Finnegan, 1989), as has poor functioning in the area of state behaviors (Kaltenbach and Finnegan, 1989). Further, seizures seem to occur at a greater frequency in this group of infants, and usually in the second week of life.[45] Gastrointestinal symptoms include frequent vomiting and diarrhea, causing "reduced intake despite a voracious appetite (Kandall, 1991)." Also, our own clinical observations have found that infants who go through withdrawal typically experience stomach cramps caused by excess gas. Respiratory signs associated with withdrawal include tachypnea as well as hyperpnea, and these infants also present with a variety of autonomic symptoms such as mottled skin, frequent sneezing and yawning, lacrimation, and difficulty with appropriate temperature control resulting in fevers (TIP manual, 1993, Kandall, 1991, Finnegan and Kandall, 1992). We have also found that an infant undergoing withdrawal may present with a dusky appearance around the mouth and eye regions.

In sum, while there is no evidence of neurological "damage" to the opioid-exposed infant, the infant who experiences acute withdrawal displays a wide range of neurobehavioral disorganization in the autonomic, state, and motor realms. It further becomes clear that an infant during this period of time is likely disorganized in the attentional/interactive realm as well, making a challenging interactive partner. His disorganization may impact quite negatively on an already vulnerable parental figure: for example, the infant's hyperirritability and difficulty to soothe can discourage a caregiver, and especially one who may feel guilty about her drug use, and who may be

[45] Kandall (1991) reports Herzlinger's et. al. (1977) findings that seizures appear in 1%-2% of heroin-exposed, and in 5%-7% of methadone-exposed neonates.

predisposed to depression and/or low self-esteem (Beeghly and Tronick, 1994, Brooks, et. al., 1994). An infant's hypertonicity combined with his vulnerability for overstimulation may make him react adversely to physical attempts to hold and soothe. His difficulty in feeding can be quite frustrating for a caregiver, and might be experienced as rejection. Als (1979), writing in a general manner about high-risk infants in interactions with their caregiver, comments:

> The handicap...interferes with the infant's self-regulation...but there is also interference in the feedback system with the caregiver: the infant's signals and communications are different, often distorted and difficult to interpret, while the adult is wired up for normal baby behavior. Aside from that, the adult is often caught up in a process of guilt and grieving for having a damaged infant. Energies get only too easily channeled away from facilitative, mutually enjoyable interaction. (p.32)

In sum, the infant's behavioral disorganization is significant not only in terms of his early developmental tasks of homeostasis and self-regulation, but must also be considered in light of its effect on the parental caregiving environment, one that is typically vulnerable as well. As Beeghly and Tronick (1994) write, "...both the exposed newborn and drug using caregiver are likely to be difficult regulatory partners." (p.168)

Opiates, Developmental Outcomes

> **"At this point in time we know very little about the range of developmental outcomes to expect in drug-exposed children or about the etiology of such outcomes. It is probably fair to say that these children are at increased biological and social risk; that their outcome is undetermined; that the full range of intellectual and social-emotional outcomes are possible; that neither biological nor environmental factors can be ruled in or out as determinants of the developmental outcome in these infants." Lester and Tronick, 1994 (p.118)**

"There is no convincing evidence that exposure to narcotics in utero results in abnormal cognitive or developmental delay in infants when exposed infants are compared to controls of similar SES." Zuckerman and Brown, 1993 (p. 150)

At the present time, developmental follow-up of children exposed to drugs in utero is still in its beginning stages. Preliminary results are diverse, inconsistent and often contradictory (Lester and Tronick, 1994). The main problem that has been identified regarding research to date is that studies have been unable to capture and control for the myriad of both pre- and postnatal variables that affect the drug-exposed infant (Lester and Tronick, 1994, Zuckerman and Brown, 1993, TIP manual, 1993, Kandall, 1991). Given the prevalence of polydrug use and the methodological difficulties inherent in ascertaining the exact type, timing and type of drug of exposure, direct drug effects have been difficult to ascertain, and the majority of studies involve polydrug-exposed children. Further, studies have not been able to adequately assess for the complex and varied effects of either the child's own temperamental characteristics, his individual strengths and challenges, or for the impact of various environmental conditions on his development. In addition, even though drug use during pregnancy is not solely a phenomenon of poor and minority women, study populations at this point remain almost exclusively of this group. As a result, documented developmental outcomes to date are of biologically vulnerable children who must mitigate not only the impact of addiction and its sequelae, but also the

impact of poverty and associated stressors. [46] Kandall (1991) writes,

> Despite the fact that heroin abuse has existed for many years and methadone maintenance has been widely used since 1969, follow up studies...remain preliminary and fragmentary. Acquisition of meaningful follow-up data has been hampered by failure to accurately document maternal drug-taking patterns, inability to quantitate drug intake during pregnancy, failure to account for the confounding fact of alcohol consumption, difficulty in maintaining a full cohort group of infants after hospital discharge, inability to generate a suitable control group, and difficulty in differentiating the organic effects of opioids from the impact of a socioeconomically deprived environment. (p.406)

With these factors in mind, the results of limited follow-up studies suggest that intrauterine opioid exposure does not lead to major neurobehavioral abnormalities or cognitive delay in children, and groups of these children have generally tested within the normal developmental range on standardized developmental exams (Zuckerman and Brown, 1993, TIP manual, 1993, Kandall, 1991)[47]. However, the research also indicates that developmental outcome of these children is strongly mitigated by environmental factors. Zuckerman and Bresnahan (1991) report on a study by Lifschitz et al. (1985) which found that when compared with a non-exposed control group at two years of age, methadone-exposed infants demonstrated signs of developmental delay only when prenatal exposure was also confounded by low SES, indicating that "...among infants exposed to opiates

[46] Lester and Tronick (1994) report on a recent study (Chasnoff, Landress, and Barrett, 1990), which found that the incidence of illegal drug use was comparable between lower- and middle class pregnant women. They point out that "this study, if replicated, would change the way society thinks about drug use during pregnancy and would also provide the methodological opportunity to study drug-exposed children growing up in more positive environmental conditions. (p.114)"

[47] It is significant to note that the vast majority of studies focus on the measurement of cognitive rather than socio-emotional outcomes. As emotional development is so essentially tied to sensorimotor experience in early infancy, and may also have a significant influence on cognitive functioning, this bias may prove to be especially damaging.

in utero, the quality of the postnatal environment and not the amount of maternal opiate use appear[s] to be the more important determinant of outcome. (p. 1389)"

Cocaine, Medical Effects

In a recent review of the literature, Lester and Tronick (1994) report that early studies detailing the medical effects of intrauterine cocaine exposure were alarming, exaggerated, and fraught with methodological inadequacy. At the present time, our most reliable research shows that cocaine use during pregnancy may be linked to a higher risk for spontaneous abortions, shorter gestational age, decreased head circumference, a higher incidence of cranial abnormalities, shorter birth length, lower birth weight and maternal vasoconstriction, resulting in fetal vascular disruption (Lester and Tronick, 1994, TIP manual, 1993, Singer, 1993, Volpe, 1992, Hawley and Disney, 1992, Kandall, 1991). Again, it must be remembered that in addition to the many risk factors inherent to an addictive life-style, as well as the prevalence of polydrug use, our reports come from studies of women living in poverty. These outcomes must therefore be understood in the context of a "multifactorial model" (Zuckerman and Bresnahan, 1991), which takes the possible effects of these and other variables into account.[48]

Cocaine, Neurobehavioral Effects

"...the neurobehavioral effects of prenatal cocaine exposure appear to be complex and do not constitute a predictable

[48] In a recent review, Dixon (1994) writes that, "Pregnancies complicated by stimulant drug use may place the infant at neurological risk resulting both directly and indirectly from the drugs themselves," and lists some of the factors that may accompany a pregnant woman's cocaine use. Included in this list of secondary complications are no prenatal care, hypertension, infectious diseases, trauma, psychological stress, social isolations, conditions of poverty, depression and other psychiatric illness.

syndrome appearing in every cocaine-exposed infant." Hawley and Disney, 1992, (p. 5)

"The simple truth at this point is that we do not yet know what the effects are of prenatal cocaine exposure." Myers, et. al., 1992 (p. 1)

Unlike the rather consistent and well-documented effects of intrauterine opioid exposure, the neurobehavioral effects of intrauterine cocaine exposure remain uncertain, and there is no documented "withdrawal syndrome" as is the case with opiates. While cocaine-exposed infants may exhibit some of the effects common to the NAS, Dixon (1994) states that "'withdrawal' is the wrong word to apply to this acute toxic period that may last from days to weeks and may have many, some, or none of the behaviors associated with narcotic withdrawal" (p.142). The condition of infants exposed to cocaine in utero is generally described as "cocaine neurotoxicity," and consists of a number of symptoms that appear in varying intensities and combinations.

Several recent review articles report that not only is there a dearth of research in this area, but the findings to date are inconsistent, often contradictory, and studies have not adequately controlled for the prevalence of polydrug use and other important variables (Lester and Tronick, 1994, Beeghly and Tronick, 1994, Dixon, 1994, Zuckerman and Brown, 1993, Singer, et. al., 1993). At present, while a few studies report no neurobehavioral effects of intrauterine cocaine exposure in the neonatal period, other studies report neurobehavioral disorganization in many cocaine-exposed infants in the autonomic, state, motor and attentional-interactive realms, with a particular focus on early difficulties for self-regulation. Some of the specific

neurobehavioral outcomes of intrauterine cocaine exposure in the neonatal period are thought to include abnormalities of muscle tone including hyper- and hypotonia, tremors, disorganized reflexive responses, increased jitteriness, high-pitched and excessive crying, vigorous sucking, labile state organization, disorganization in sleeping and feeding, and impaired interactive abilities (Beeghly and Tronick, 1994, Zuckerman and Brown, 1993, Singer et al, 1993, Stallings-Sahlen, 1993, Volpe, 1992, Myers, 1992, Finnegan and Kandall, 1992, Kandall, 1991). Dixon (1994) hypothesizes that the effects of cocaine abstinence may be quite similar for infants as they are for adults, representing a "prolonged period of behavioral reorganization" (p138) that brings with it a vulnerability for depression[49] and changes in appetite, sleep, and alertness. These effects, Dixon states, are seen with "...wide intra- and interindividual variability." (p.135)

For the majority of cocaine-exposed infants, pharmacological treatment is not indicated, and there appears to be some consensus that the symptoms associated with cocaine neurotoxicity tend to be transient, and are less severe and striking than the neonatal abstinence syndrome that appears in opiate-exposed babies in the neonatal period (TIP manual, 1993, Volpe, 1992, Myers, 1992, Kandall, 1991). Lester and Tronick (1994) make the following statement about infants prenatally exposed to cocaine:

> In the vast majority of these cases these infants are probably not damaged; in fact, many appear quite normal but there are a significant proportion of these infants who appear stressed and show disorders of behavioral regulation. (p.112)

In sum, while there is no firm consensus on the type and range of

[49]Dixon's hypothesis matches my impressions of cocaine-exposed newborns in that I find their overall affective state to resemble what we would define as "depression" or as a depressed state in adults. However, and perhaps due to the general lack of interest in neonatal emotions, this term is rarely applied to very young infants.

behavioral symptoms caused by intrauterine cocaine exposure in the neonatal period, our understanding so far seems to indicate that infants so exposed often exhibit various signs and symptoms that (as is the case with opiate-exposed neonates), are perhaps best captured by the concept of "neurobehavioral disorganization."

Clinical Impressions

My own clinical impression, which will be explored more fully in the following chapter, support others' findings of early behavioral disorganization in cocaine-exposed infants. While the symptoms displayed by cocaine-exposed infants are usually quite different from an infant going through opiate withdrawal, they may be equally severe. While the opiate-exposed infant tends to present in a overall hyperirritable manner (including increased tone and reflexes, excessive crying, low tolerance for external stimuli, etc.), the cocaine-exposed infant tends to present in a lethargic, depleted and detached manner, punctuated by occasional bouts of irritability when disturbed. Due to the lethargic impression of many of these infants, and their long and often excessive periods of sleep, many nurses and other clinicians label these "the good babies," a perception which, on several counts, I find to be inaccurate and misleading.

While it is correct that the opiate-exposed infant appears to be in more severe and chronic discomfort, he tends also to show more appropriate ability for early human attachments. In my clinical experience I find that the majority of opiate-exposed infants are able to elicit appropriate attachment

behaviors from their caretakers through crying, clinging and following,[50] and conversely, they are usually soothed by skilled and loving caretaking. While an infant going through opiate withdrawal demands a great deal of time, effort and emotional resource from his caretakers, this infant tends to be very expressive, and when calm, quite appropriately interactive. On the other hand, many cocaine-exposed infants present in a lethargic and emotionally detached manner. They tend to be difficult and slow to rouse, and often become quite irritable when awake. Cocaine-exposed infants often have trouble interacting appropriately even when in a quiet alert state. For example, active gaze aversion is a behavior that I frequently witness in a cocaine exposed infant's contact with a caregiver. In my experience, cocaine-exposed infants tend to present in a "depressed" manner, may be less emotionally expressive and receptive, and can transmit a sense of "not caring" or being "unreachable" to the caregiver. In sum, while the quiet, lethargic and detached manner of a cocaine-exposed infant may not require pharmacological intervention, may be less obvious to an observer or to a busy nurse, from a psychological perspective it is no less striking. [51]

Cocaine, Developmental Outcomes

"Although reproductive casualties may play an initiating role in

[50] These are a few of the early infant abilities for eliciting attachment behaviors from adults, as outlined by Bowlby (1982).

[51] I have observed that these differences in symptomatology between the opiate- and cocaine-exposed infants have a variety of clinical consequences, and especially effect the amount and type of interventions. For example, one tends to attend in a more immediate manner to an actively crying infant who needs comforting than to a sleeping, seemingly undisturbed baby. While it is clear from a clinical perspective that an irritable infant needs to be comforted and brought to a calmer state, it is perhaps less clear that a sleeping infant needs to be brought to an alert state. Further, since most cocaine-exposed infants do not require pharmacological treatment, they remain in the hospital setting only for a short period of time, therefore also limiting the amount of developmental intervention they receive in the neonatal period. These points remain clinically problematic.

the production of later problems, it is the caretaking environment that will determine the ultimate outcome. At the one end of the caretaking continuum, supportive, compensatory and normalizing environments appear to be able to eliminate the effects of early complications. On the other end of the continuum, caretaking by deprived, stressed, or poorly educated parents tends to exacerbate early difficulties." Sameroff, 1975, (p.12)

"...the outcome of cocaine-exposed infants is really a dyadic phenomenon involving both the biological competence of the infant as well as the protective or disruptive role of the caregiving environment." Beeghly and Tronick, 1994, (p. 160)

"The long-term outcome of prenatal substance exposure is unknown." TIP manual, 1993, (p. 4)

As I have written earlier, studies that document long term developmental outcomes of intrauterine drug exposure are scarce (Azuma and Chasnoff, 1993), and research as a whole has not been able to adequately assess for a great variety of confounding variables that effect developmental outcome in these children (Lester and Tronick, 1994, Zuckerman and Brown, 1993, TIP manual, 1993, Kandall, 1991). The prevalence of polydrug use remains a methodological problem and to date, only one follow up study of only cocaine-exposed infants has been published (Chasnoff, Griffith, Freier and Murray, 1992). Zuckerman and Brown (1993) report the results of this study: at 2 years of age, the mean scores of cocaine-exposed infants assessed by the Bayley Scales of Infant Development showed no statistical differences when compared to controls matched for SES. However, they as well as other experts speculate that the developmental effects of intrauterine cocaine and other drug exposure may present themselves in more subtle ways, and may therefore require different and more sensitive assessment tools (Zuckerman and Brown, 1993).

In the most recent of only a few prospective longitudinal studies, Azuma and Chasnoff (1993) evaluated 117 three year old children exposed to cocaine and other drugs in utero. Although these children scored within normal limits on the Stanford-Binet IQ scale, their scores were on average four to five points lower than the mean score for the non-exposed control group. Azuma and Chasnoff therefore assert that intrauterine drug exposure has "a direct effect on cognitive ability at three years of age" (p.396), but acknowledge that these results were also "mediated indirectly" through environmental and other factors.

In a recent article, Lester and Tronick (1994) write that perhaps the most valuable piece of information that has emerged from studies so far has been a more complete understanding of the problem itself (p. 111). At this point in time, infants exposed to cocaine and other drugs in utero are considered to be at increased biological, developmental and environmental risk. Prenatal drug exposure in combination with other potential medical risk factors, "...combine to produce, in some cases, an acute neurobehavioral vulnerability or fragility (Lester and Tronick, 1994, p.112)." Based on the results of extensive studies with other at-risk (most notably, premature) infants and based also in large part on Sameroff's (1975) early work concerning the transactional nature of development, it is now convincingly theorized that "good-enough" caretaking in a "reasonably sound" (Lester and Tronick, 1994) environment may inhibit the potentially negative developmental outcomes of these vulnerable children. In fact, developmental researchers and clinicians at the forefront of this field now believe that the infant's environment, and especially his ongoing relationship and interactions with his main caregivers are the key determining factors in long term developmental outcome.

Beeghly and Tronick (1994) write:

> It is our view that the long-term developmental outcome of infants prenatally exposed to cocaine or other toxic substances - as is true for all infants - is primarily determined by the quality of the affective-communicative mutually regulated system established by the cocaine-exposed infant and its caregiver. (p. 159)

Similarly, Lester and Tronick (1994) state that,

> ...the long-term developmental outcome of these children is likely to be a function of how the caregiving environment responds to the behavioral constellation of the infant with the understanding that both the behavior of the infant and the caregiving environment are making dynamic adjustments to each other as well as being influenced by other forces... (p. 117)

In sum, the data regarding the developmental outcomes of substance-exposed infants remains incomplete and unreliable. However, clinical and research experience with this and other high-risk groups of infants suggests that the infant's experiences and interactions with his immediate caretakers, and the environment's ability to respond in an adaptive and dynamic manner to the infant's needs, may very well prove to be the key determinants of developmental outcome.

The Hospitalized, Drug-Exposed Neonate: Environmental Challenges

This section examines how the environment of the Neonatal Intensive Care Unit (NICU)[52] impacts on the drug-exposed baby. Earlier in this chapter, we saw that in the majority of cases, drug-exposed infants can be considered "normal" babies who often present with behavioral disorganization, and may therefore need especially sensitive and responsive

[52] My discussions and analysis in this section are based on the NICU in which we are presently providing clinical interventions to drug-exposed babies and their mothers; while I believe that most of the issues raised in this section can be generalized to other NICU's, this fact should be kept in mind.

caretaking. We will see that in addition to his symptoms of neurobehavioral disorganization, the infant must cope with a setting that, for a variety of reasons, may not provide "good enough" "holding" in the early weeks of life.

In our medical setting, infants who have been identified as having been exposed to drugs in utero[53] , are transferred to the NICU for treatment and observation. The overall length of stay varies, ranging from 5-10 days for infants who receive no pharmacological treatment (usually cocaine-exposed babies, with no other presenting medical problems) to 10 weeks (usually opiate-exposed infants going through withdrawal and requiring medical treatment). In examining the special situation of hospitalized, drug-exposed neonates, we will see that some of their environmental challenges are specific to their "drug-exposed" status, while some are challenges shared by all hospitalized neonates.

A major aspect of hospitalization affecting all neonates concerns the medical setting, its approach, philosophy and model of care delivery[54] . To begin with, the traditional medical model does not view the hospitalized infant first and foremost as a baby with developmental needs, but as a sick patient in need of treatment. That is, hospitalized babies are viewed, first and foremost in a pathological light, rather than from a normative perspective. Despite the general absence of acute life-threatening or severely disabling medical problems for drug-exposed infants, lack of information and widespread prejudice causes drug-exposed infants to be affected especially strongly by the pathological point of view. In conversations and casual

[53] This process of identification is based on a variety and combination of factors, including maternal history and self-report, the infant's presenting symptoms, and/or urine toxicologies.

[54] For an in-depth systems analysis of the hospital caregiving environment and the challenges of early intervention services during neonatal hospitalization, see Gilkerson, Gorski and Panitz (1990).

comments, drug-exposed infants are cast in a pathological light, either by being portrayed as "hopeless, innocent victims" of "bad" mothers," or even as "little junkies" themselves.

Another way in which the pathological point of view expresses itself is that all of the infant's behaviors are categorized in regard to intrauterine drug exposure. Normal behaviors and individual differences are often obscured by drug-exposed infants' "diagnoses." For example, while all babies cry, with normal individual variations of duration and intensity, a crying, drug-exposed infant is very quickly labeled "irritable," and this is seen solely in light of his "condition." This pathological point of view obscures the normal developmental path and needs of the infants, and affects the overall care of this population.

Another main characteristic of medical settings, and one that affects all hospitalized infants is depersonalized caregiving. While clinical interventions are highly sophisticated, medical systems appear to revolve to a great extent around the daily management of their own needs, and do not prioritize the developmental needs of individual babies. Obvious examples include blood being drawn from a sleeping baby simply because the technician is present, or infants being fed on a rigid schedule to fulfill the needs of nursing staff. Lack of a developmental approach is also reflected in the physical environment, characterized by excessively bright lights and high noise levels[55]. All the above impact harshly on drug-exposed babies, who struggle with achieving and maintaining homeostasis and mastering early organizational processes.

[55] Much has been written on the quality and impact of the physical environment of the NICU, particularly in regard to the development of premature infants. For good examples, see Goldson (1992), and Lawson, Daum and Turkewitz (1977).

The human "environment" is also compromised for babies in the NICU setting. In the previous chapter we saw the intense physical and psychological need of every baby to be loved, for "holding" and personalized care from a "regulating other." A hospitalized infant can expect to be handled and cared for by several different caretakers each day. As a result, the infant must continually adjust to different handling styles, smells, qualities of touch, and degrees of responsiveness from various caretakers. This situation can present some developmental problems for disorganized drug-exposed babies, who seem to need consistency and sameness from the "regulating others" in their attempts to self-regulate. However, multiple caretaking is unavoidable in this type of setting and it is my belief that the main problems for drug-exposed babies are not primarily caused by the fact of multiple caregiving, but instead by depersonalized care, reflected especially in inadequate responsivity to infant cues as well as in qualitative aspects of touch and handling.

While all babies in the NICU are potential recipients of depersonalized care from multiple caregivers, this fact is often and hopefully mediated by the loving and consistent involvement of the infant's family. In general, this is another main area of vulnerability for the population of drug-exposed infants. However, it should be underscored that just as drug-exposed infants are not a homogenous group, the parents of these infants also present in many different ways, and a single profile is impossible to establish.[56] Among the parents, we find a wide range of stability, health, supports and overall functioning. However, it is clear that as a group, these parents deal with many stressors and risk factors, some of which impact directly on their role and

[56] There is a great gap in our knowledge regarding the lives and varying profiles of the parents, and especially the mothers of drug-exposed babies. As a group they are stereotyped, discriminated against and in some states, legally prosecuted.

development as parents and on their interaction with their babies. As the mother is generally the most involved parent for this population, and as the social and legal implications of the infant's drug-exposure focus almost exclusively on the mother, she will be the center of my discussion below.

Just as a normative rather than a pathological perspective is indicated for the population of drug-exposed infants, so the infant's mother might best be viewed as a mother who presents with special needs, rather than as a drug-addict or a criminal. Like most mothers, the mother of a drug-exposed baby feels love and many other strong feelings following the birth of her child and like most mothers, she wants to bond with and get to know her baby. However, because of her special situation, many different factors - psychological, social, economic and environmental- impact on her early mothering tasks.

To begin with, like all mothers whose babies are hospitalized in the NICU, she is concerned about her baby's health. Also like other mothers, she may feel intimidated by the swiftness and competence of medical personnel, who seem to be able to take care of her infant better than she can. Added to this concern is usually a strong sense of guilt associated with her drug use, which is again often exacerbated by a hostile and blaming environment. Further, this mother continues to deal with the various stressors and crises that led to and maintain her drug use. Poverty and homelessness, physical and sexual abuse, single parenting and lack of family support are a few of the common and major stressors for the currently identified population of drug using women[57]. Lastly, the mother of a drug-exposed infant must often deal

[57] As has been stated earlier, one of the main drawbacks of our current scientific approach and resultant gap in knowledge concerns the fact that the population of pregnant, drug-using mothers identified to date consists mainly of poor and minority women. In a clinical setting also, these are the women most readily identified.

with the very real fear of investigations by the child welfare system and the resultant possible loss of custody of her child, and this must be recognized as well.

All of the above factors impact on the mother's relationship with her infant, with her ability for bonding and "holding" and with his ability to use her as an effective "regulating other." Her worry about the infant's health and her feelings of intimidation regarding staff competence with her child may produce in her feelings of hesitancy and powerlessness, and this may result in insecure or infrequent handling of the infant. Her own "behavioral disorganization" as a result of psychological stress, illness, active drug use or withdrawal also impacts on her care and handling of the infant, and on her ability to be a "regulating other" for the baby. This can be seen in a variety of behaviors such as lethargic, unresponsive, insecure, unrelated "holding," or very fast, exaggerated handling, bouncing the baby quickly, overstimulating the infant by excessive talking, and so on. The key common factor in all these diverse caretaking behaviors is the mother's difficulty to accurately observe and respond to her baby's behavioral cues.

In my own clinical work I have found that the mother's feelings of guilt regarding her drug use, and especially as drug effects are manifested in the baby's overall health and behavior, consistently emerge as a major theme. These feelings are further exacerbated by a blaming and hostile environment, and they impact directly on the mother's interactions with her baby. Specifically, I have observed that the mother's feelings of guilt often make it very challenging to perceive her baby as a separate entity: each and every one of his cries, she believes, is caused by her drug use; every tremor, every turning-away from her, every strain of the body is "taken personally," and

interpreted in relation to her own behavior. These feelings quickly become intolerable, and she may begin to function in an overly protective manner in regard to the child and appear self-sacrificing in her behaviors. Conversely, her feelings of guilt may cause her to "tune out" when with her infant, and produce in her a lack of sensitivity to the baby's initiations. The mother's guilt may further lead to strong feelings of ambivalence in regard to her baby, and combined with her fears regarding the real possibility of losing custody of her child due to illegal substance use, may be so overwhelming that they lead to actual abandonment of the child[58].

In sum, we have seen that the majority of drug-exposed infants can be viewed as normal babies who are affected by varying degrees of behavioral disorganization, and that this population may need especially sensitive and skilled caretaking in order to thrive. However, as was seen in this last section, these babies must also cope with an environment that is largely inappropriate for the facilitation of normal developmental processes, and often unresponsive to their needs. Further, and very importantly, the parents of drug-exposed infants are often multiply and severely stressed, and may not be able to adequately compensate for the developmental limitations of the medical setting. All these factors strongly speak to the need for early intervention, and specifically to the need for the facilitation of a good-enough "holding environment" (Winnicott, 1960) for these babies. It is this early intervention effort that is at the heart of the following chapter.

[58] In my own clinical work I have found actual abandonment to be a rare occurrence, but I have nevertheless seen that these guilt feelings are one of the main hindrances to a positive early relationship between mother and baby.

CHAPTER 5

A CLINICAL APPROACH: EARLY INTERVENTION WITH DRUG-EXPOSED NEONATES IN AN INTENSIVE CARE SETTING

"The holding, I mean. Because I know there's a right way and a wrong way to hold a baby. You got to let the baby know you're in charge, you're strong, but you still got a soft heart for them, all at the same time. They can feel it in your touch. They know when somebody don't care.....Sometimes I think they smarter than we are." - "Nettie Lee," volunteer in an NICU. Rocking the Babies, Raymond, 1994.

Introduction

The developmental needs of the very young drug-exposed infant are no different than those of other infants. He is faced with physical survival and with the "coming into being" of his "true self" (Winnicott, 1960). His tasks of neurobehavioral organization and emotional integration go along with the achievement of "basic trust" (Erikson, 1960), and require the matrix of mutual regulation (Als, 1979), or a "holding environment" in which to develop. However, as we have seen in the previous chapters, while most drug-exposed infants are not neurologically or otherwise "damaged," most are faced with a series of special challenges, all of which impact on the normal processes of early development. We have also seen that it is the environment's ability to respond in an individualized and dynamic manner to the infant that is presently postulated as the key determinant of developmental outcome. Therefore, an early intervention approach that addresses these special challenges and facilitates normal developmental processes appears indicated for this population.

This chapter describes a developmental approach to early intervention, implemented in the Neonatal Intensive Care Unit (NICU) of a large, urban teaching hospital. This approach acknowledges the necessity of family-focused intervention, and includes interventions with parents, and active collaboration with medical, nursing and social work staff. Further, in our aims to provide a "good enough" holding environment for these families, this intervention also includes negotiation of the medical setting as a whole, including active participation in treatment and discharge planning. However, the main focus of the present chapter concerns primarily the process and content of clinical interventions with drug-exposed infants throughout their

hospital stay. Interventions with parents, staff and the negotiation of the medical setting as a whole will only be discussed in a limited manner, and primarily in relation to intervention with the babies.

As will be seen, a key feature of this clinical intervention and its approach is that it emphasizes health and normal developmental processes over pathology. The infant is viewed not primarily as the "patient," with a main focus on his symptoms, but rather with a consistent focus on the normal processes he is attempting to master. In other words, as a clinician it is always my aim to see and to discover the normal baby "underneath" the presenting symptoms or problems, and it is a main hypothesis of this intervention that facilitating the normal developmental path is key to the infant's ability to mediate his special challenges.

At the heart of this chapter lie the following questions: 1) How can normal developmental processes be best facilitated, in light of the special needs of the infant as well as the special features of the environment? And 2) What does early intervention with drug-exposed infants look like? These question will be addressed in two parts: In the first section of this chapter I will describe the 'how' or process of the intervention, discussing what I perceive to be its major components. The key characteristics of the circular and ongoing processes of observation, assessment and intervention will be explored, and the role of the clinician, including the separate but interrelated cognitive, emotional and physical components of skill required to accurately observe, assess, communicate, and intervene with the very young infant will also be addressed.

The second section of this chapter is primarily concerned with content, with what makes up the intervention itself, and applies our understanding of

normal developmental processes (as described in Chapters 2 and 3) to early intervention with drug-exposed[59] infants. Through clinical illustrations and discussion, we will examine various interventions to promote optimal functioning in the various subsystems that make up early infant neurobehavioral organization, and explore the concept of the infant as an active participant as this is manifested in clinical intervention. Finally, this chapter describes the interventions that address the early emotional development and "emerging sense of self" of the substance-exposed infant and details the opportunities as well as the limitations of the present intervention approach in providing a good-enough "holding environment" for this population.

I: The Processes and Components of Developmental Intervention

"While I touch I am also being touched." Schachtel, 1959, (p.103)

Clinical Observation

Observation is the process of gathering information prior to the use of interpretive or analytic processes. It is the first step at the start of an intervention, it determines both assessment and intervention, and it is also an essential guide and ongoing part of 'being with' an infant throughout the intervention process. That is, in successful therapeutic interactions, the clinician is continually observing the infant's behavior, his cues and active initiations, as well as his responses to the intervention. In addition, I believe that the clinician must also become adept at observing her own reactions to a particular infant or situation, and must be able at least to identify those

[59] As in the rest of this work, particular attention will be paid to infants exposed to cocaine, opiates, or to a combination of substances, and the intervention presented deals primarily with neurobehaviorally disorganized, not neurologically compromised babies.

reactions, thoughts, emotions. This is especially significant in work with very young infants, who rely on the caregiver's "use of self" in negotiating attachment processes, and whose early development appears to be influenced significantly by the qualitative aspects of interaction as much as by the quantitative aspects of interaction. That is, an infant responds as much to *how* he is held, touched, carried, spoken to etc., as to *what* it is that is being done with him.

A main area of clinical observation concerns the drug-exposed infant's neurobehavioral organization, and his negotiation of the autonomic, motor, state and attentional/interactive subsystems. In addition to observing the presence, range and quality of behaviors in each of these realms, attention should be paid to the infant's affect and emotional expressions, as well as to the quality of his learning processes as evidenced in his motivation for active initiations and abilities to integrate new sensory information. Further, in the observation of each of the subsystems, the infant's self-regulatory behaviors should be noted: that is, what does the infant do to manage stimuli and how does he self-organize?

While it is the goal of observation to gather information regarding the infant's behavior, and is clearly not interpretive, it is also not "objective." What we see, how we see it, and why we see it is dependent on many factors, including our theoretical frame of reference, our clinical experience, and colored also by our conscious and unconscious emotional reactions to a particular infant or situation. Relatedly, because of the very nature of the young infant and his means of communication, especially in regard to the essential and primitive interrelatedness of the cognitive, emotional, perceptual and physical realms (Als, 1979, 1982), successful observation of

infants involves not only cognitive processes and the use of vision (often thought to be our most "objective" sense), but also physical and emotional components and our use of tactile, proprioceptive and auditory (often thought to be our "subjective") senses. For example, an infant's muscle tone can only be observed in a very limited way through vision alone - it is not until one holds a baby, and through proprioceptive and tactile feedback, that the quality of his tonal organization can be fully observed and appreciated.

I believe that in a clinical context this "subjectivity," while potentially problematic, is essential. That is, to understand an infant's behavior and to be able to observe what may constitute a representation of his subjective experience, the clinician must be skilled not only in visual observation, hearing and touching, but must also be able to emotionally "identify" (Winnicott, 1962) with the infant's experience. However, this clinical work with infants also demands of the clinician to define her particular "subjectivity" to the fullest extent possible: she must be able to differentiate between the various sensory tools for information gathering and use them selectively and appropriately, and, of ultimate importance, she must be able to differentiate between the infant's subjectivity and her own. In sum, I believe that successful observation depends on the clinician's ability to articulate what behaviors she is focused on observing, why she is choosing this focus, as well as how, or the means by which she is observing.

Clinical Assessment

Clinical assessments are made in various contexts and take different forms. In the context of an intervention session, assessments are short term and are made and revised continually, immediately following and even

alongside the observational process. In this context, an assessment provides a brief clinical summary of what has been observed, and organizes this information with an eye toward clinical interventions. While more formal, standardized assessments may yield useful information, in my own clinical work I am particularly interested in assessing an infant's functioning in the context of everyday tasks: that is, how the infant responds to vestibular stimulation can be determined by picking him up or by moving him through space in the context of a caregiving task; the infant's muscle tone and his reflexive responses can easily be observed and assessed in the context of changing his diaper and in a feeding; his level of irritability and ability to be soothed can be assessed in interaction, and so on. These assessments tend to be rather informal and fluid, constitute the majority of assessments in my own clinical work, and will be the primary focus of the present discussion.[80]

As it is the task of assessments to organize observational information with an eye towards clinical interventions, it is important to understand *how* one is organizing the information and what underlying assumptions and principles shape that organization of information. For example, if one's clinical perspective is focused on pathological processes and has at its primary goal the alleviation of "abnormal" symptoms, assessments and the resulting interventions will reflect that orientation. On the other hand, if the clinical focus is on the discovery and strengthening of normal developmental processes, and symptoms are viewed in the context of the normal developmental path, this will also be reflected in the organization of information and in the clinical interventions. These differences in

[80] A more "formal" assessment called the "Neonatal Drug Withdrawal Scoring System" is frequently utilized by physicians, nurses and therapists at our site to assess the overall functioning and need for pharmacological treatment of opiate-exposed infants. There is no similar assessment system for cocaine-exposed infants.

assessment and intervention are, I believe, at the heart of the difference between a traditional medical and a developmentally based approach to treatment, and become especially important when providing developmental intervention within a medical setting.

Every infant, whether developing normally, or at risk for abnormal development needs to master early organizational processes. As has been reviewed in Chapter 2, there may be a wide range to what constitutes normal behavior, and I believe that it is the degree and persistence of behavioral disorganization in one realm and the degree and persistence of its functional effect on other developmental realms that determines its "normalcy." That is, "normal" infants may have trouble with early organization in the autonomic realm, and may remain fussy and irritable for several weeks; however, with the active assistance of a good enough "holding environment" this irritability resolves and does not further impact on that infant's development.

An opiate-exposed infant in the setting of an NICU may exhibit excessive irritability, and like the "normal" infant, this may be due to early "colic" or constitutional temperamental characteristics, and is usually also compounded by the medical effects of withdrawal. However, the stressful physical characteristics of the NICU environment as well as depersonalized care by multiple caregivers will compound his difficulties. Nonetheless, while the opiate-exposed infant's irritability is likely a combination of both "normal" and "abnormal" factors, his symptoms are automatically viewed in a more pathological light.

In assessing a drug-exposed, symptomatic infant from a perspective that emphasizes normal developmental processes, clinical observation is

guided by the following main questions: What normal tasks is this baby trying to accomplish? What appear to be his constitutional and developmental strengths and how are these being expressed? What are his developmental needs at the moment and are they being provided? What is the infant communicating and how is he communicating, what is he "telling" us through his "language" of the various subsystems and in the emotional realm? What is the degree and persistence of his behavioral disorganization and how is this disorganization improved or worsened by the infant's environment and "regulating others?" What can be known regarding the cause of his symptoms - are they a biological result of withdrawal or cocaine neurotoxicity, are they a behavioral response to immediate environmental factors, and/or are they also related to that infant's constitutional tendencies, somewhat independent of his present condition? Finally, how are all these factors interrelated in any particular situation?

In sum, it has been my experience that while assessing drug-exposed infants in a medical setting, the clinician needs to guard continually against the automatic assumption of a pathological point of view, and needs to take into account the interplay of medical, constitutional, neurobehavioral and environmental factors. It is only through an analysis of these factors that the clinician can plan for appropriate, individualized interventions.

Finally, as with observation, assessment of very young infants involves not only the clinician's use of vision, but also her tactile and proprioceptive senses. For example, an infant's response to vestibular stimulation, sometimes subtle, can be most successfully assessed by actually moving the infant through space and registering his reactions both visually and proprioceptively. As was discussed in the realm of observation and as is also

true for the actual intervention, in assessing an infant's subjective emotional experience, the clinician must be able to emotionally "identify" with the infant. This complex interweaving of different sensory modalities, as well as the tensions inherent in this work between "objective" and "subjective" information call for the clinician's ability to be skilled at differentiating between the various modalities as well as between the infant's subjectivity and her own.

Clinical Intervention

> **"From what we know so far, the supports and interventions that substance-exposed infants need are no different from what other babies need." Zero to Three, 1992**

Clinical interventions are the actions the clinician takes with the infant[61], based on the previous gathering of information (observation) and organizing and prioritizing of that information (assessment). Interventions are carried out alongside, and in response to these ongoing observational and assessment processes, and are continually revised in accordance with the infant's changing needs. As has been stated before, the goal of this particular intervention is to support and strengthen the drug-exposed infant's abilities for normal developmental processes, and it is a hypothesis of this work that by doing so, the infant is helped to mediate his special developmental challenges. I believe that interventions with very young drug-exposed

[61] To be even minimally effective, and consistent with the information we have gained from a transactional approach to development, a hospital- based intervention program for substance exposed infants must address not only the immediate clinical needs of the infant, but must work with several aspects of that infant's environment (parents, staff, physical environment, medical "system" as a whole) in a coordinated and simultaneous manner. While the intervention program at our site does provide intervention in these other areas, the present sections' main concern is the clinician's one-on-one relationship with the drug-exposed infant.

infants must be consistent, personalized, individualized and flexible to meet that particular infant's strengths and challenges as well as his emerging developmental abilities.

As this intervention is grounded in normal developmental principles, the drug-exposed infant is assumed to be an active participant in his own development (Piaget, 1952), and is seen as possessing innate "self-righting" and "self-organizing" tendencies (Sameroff, 1975), as discussed in Chapter 2. This developmental intervention uses the infant's active contributions and assumes a 'partnership' between infant and clinician towards the mutual goal of the baby's behavioral organization and emotional well being. It is a main assumption of this intervention that the clinician's prompt, selective and informed response to an infant's behavioral cues acts in an organizing manner for the infant (Ainsworth, 1972), assists the baby in his emerging organization, and thus also improves his chances for mutually satisfying interaction with the "regulating other" (Tronick, 1989).

In this intervention, the drug-exposed infant is not assumed to be passive, and nothing is done "to" the baby; rather, his active initiations -in the form of movements, cries and other behavioral cues- are honored and utilized as a guide for shaping and prioritizing interventions. For example, when working to facilitate a stronger and more efficient sucking pattern with an infant, his present behavior is first observed and assessed, and the intervention is initiated by responding, interacting with, and modulating *his own* movements, rather than immediately attempting to pattern a new and more efficient movement *onto* the infant. It is theorized that this approach is more effective not only because it helps the infant to better organize his sucking response, but also because it helps the infant to learn that he can use

his own resources (and in interaction with another) to master this challenge. As the infant is an active learner, he can generalize this 'understanding' to other early tasks (Piaget, 1952). As Connor, Williamson and Siepp (1978) state in regard to the motor realm, "The baby learns from the sensations of movement, which are gained mainly from active, rather than passive movement (p. 100)."

The principle of the infant as an active participant in his own development also influences the level/degree of intervention at a given moment. As the clinician, I consistently ask myself: What can this baby do for himself? And, what type and degree of intervention is needed at a given moment? For example, a baby who is fussing or crying softly in his bassinet upon waking may not immediately require picking up, holding, moving, patting on the back to soothe, etc. With all interventions, it is important to first determine the least amount of assistance that a baby needs in order to self-regulate. That is, this same fussing baby may only need for the clinician to come over, be engaged in friendly "conversation;" perhaps the interventionist will place one hand on the baby's belly to help him organize, or to prevent further disorganization. It is only when these more limited interventions are insufficient, that the clinician will try something more intensive. In this way, the infant is given the opportunity to self-regulate to the extent of his abilities, and is thus encouraged and enabled to "learn" from his own self-organizing behaviors.

It is useful and necessary to observe and assess the various interrelated subsystems of neurobehavioral organization (Als, 1979, 1982) as they exist within an individual infant in a somewhat distinct manner, and even in the process of intervention, specific actions are usually taken to address specific

challenges, as will be illustrated later on. However, it must at the same time be recognized that these "separate" realms of developmental functioning are constructed in order to help clarify our own understanding, but that they are not separate at all; that is, in a very young infant, motor organization cannot be separated from emotional experience, autonomic organization from state behavior, and so on. Personalized intervention is dependent on the clinician's ability to perceive, feel and 'hold' the infant as a whole being, and successful intervention relies on the ability of the clinician to perceive the whole person as well as his separate areas of functioning simultaneously.

Relatedly, and as was addressed in the previous pages, clinical intervention with the very young infant requires many different aspects of the clinician: she must observe and interact visually, speak and hear, touch and be touched, feel and be felt, move and be moved, and she is required to reflect cognitively on all the above and organize it efficiently. In addition, not only is any one of these modalities to the exclusion of others insufficient, in each modality, the clinician must have a range of skilled behaviors. In this context, individualized care means that the clinician's senses and actions are continually modulated, adapted and refined in interaction with an individual infant and his particular organization as reflected in his constitutional, neurobehavioral and emotional make-up.

The interventions that are part of my own clinical practice have been developed through professional training and experience, and will be explored in a more specific manner later in the chapter. However, the majority are not based on a set of strict techniques, and I believe that what I have outlined above is the conceptual foundation of what makes up clinical intervention with infants. In a sense, most of the skills described here are what we may

associate with the "mothering" of a young infant, and like mothering, it is both very complex and very simple.

This type of intervention is simple because it is simply about 'being with' another, in a responsive, intelligent, loving manner, and it is complex for the same reason. It is complex because it requires attunement not only to the infant's behaviors and expressions on a multitude of levels, but also, and in a very fundamental way, it requires our 'use of self' and attunement to our own multitude of behaviors, thoughts, feelings and actions. It is further complex because while much of what is demanded of the clinician may be similar to "mothering," the clinician is not the infant's mother or primary caregiver, and this issue must be addressed in a conscious manner. The clinician must ask herself, and determine: "Who am I to this baby?", and become clear in her own mind regarding the contributions she has to offer as well as clarify the necessary and appropriate limits of her impact. While this issue is of special significance for the clinician, particularly in regard to her own management of feelings and attachment processes, I believe that emotional clarity in this regard is significant also as it manifests in the emotional tenor of our actions with babies[62].

In sum, I believe that successful clinical interventions are shaped by a series of questions, which are continually present in the clinician's mind, and include the following: How can I best strengthen and facilitate the infant's present developmental tasks? What is the quality and content of his behavioral cues, what is he "telling" me? Based on my assessments regarding the infant's strengths, needs and level of organization in a particular realm,

[62] Our clarity in this regard is clearly also of great importance in the clinician's interventions with parents of these newborns, and in the work of supporting them and being allied with them in their role as parents.

what does he need from me? How can I establish, communicate and maintain a felt sense of "partnership" with this baby, allowing for the maximum amount of his activity and self-regulating potential? And, what am I communicating to the infant through the use and quality of my voice, my touch, my movements and my overall affect?

Finally, an important part of the intervention process is the ability and flexibility to rethink and re-evaluate our actions. Some of the time, much of the clinician's actions are "trial and error," and we must be willing to ask ourselves: What was successful and why? What did not work and why? What might I try instead, or in addition? It is through these questions that the cycle of observation - assessment - intervention remains active throughout the intervention process.

II: Facilitating Neurobehavioral Organization in Drug-Exposed Infants

The main focus of intervention concerns the drug-exposed infant's neurobehavioral organization, and has at its goal the facilitation of the infant's smooth functioning in the autonomic, motor, state and interactional/attentional subsystems. As was discussed in Chapter 2, early neurobehavioral organization builds the groundwork for the "Two Month Shift" (Emde and Buchsbaum, 1989), a significant developmental milestone for infant and caregiver alike. While it is important to remember that each infant presents in an individual and distinct manner, and that his behavior is more than the sum of its parts, I find it clinically useful to begin by addressing the various developmental realms in a somewhat distinct manner.

The Autonomic System: Characteristics and Interventions

It will be remembered from Chapter II, that the autonomic system refers to all activities associated with physiological regulation and the autonomic functions of the nervous system. Organization in this realm sets the baseline for survival and well-being on its most primitive level. These physiological regulatory tasks appear to be the earliest tasks for the normal infant, and underlie and support the development of the other subsystems of behavioral organization (Als, 1979, 1982). Overall, and in addition to the observation of disorganized autonomic symptoms, the degree of normal functioning in this realm can be observed in the infant's attentional focus: when autonomic regulation is smooth overall, it appears that the infant is more able to focus on external stimulation; conversely, an infant who is physically uncomfortable (due to chronic diarrhea, intestinal cramps, excessive sweating or other symptoms) may attempt to self-regulate by 'turning inward,' and thus resist further sensory input.

Opiate-Exposed Infants

Drug-exposed infants, and especially opiate-exposed infants going through withdrawal usually show a variety of disorganized behaviors in this realm. However, it should be remembered from the outset that each infant going through withdrawal does not usually present with all of the symptoms described below, and that they present in varying combinations and with differing degrees of severity. Stress signals that are evidenced for opiate-exposed infants in the autonomic realm include: difficulties in temperature regulation as evidenced in fevers and excessive sweating; gastrointestinal difficulties as evidenced in loose, frequent and explosive stools, excessive gas

and intestinal cramps; frequent startles; tremors; increased respiratory rate; changes of skin color as evidenced in "dusky" areas around the eye and mouth regions and in overall "mottling" of the skin; repetitive sneezing and yawning, and frequent vomiting. In addition, most infants so affected display varying degrees of irritability as a result of the discomforts caused by the above symptoms (Finnegan, 1984, 1990, Kandall, 1991, Finnegan and Kandall, 1992, TIP manual, 1993).

The goal of intervention in this realm is to assist the infant in the regulation of his autonomic system. Broadly speaking, the main function of intervention here is to reduce and modify incoming stimulus, and to assist the infant to "turn inward," in order to accomplish autonomic self-regulation. A specific intervention in this regard has to do with a modification of the infant's immediate environment. In our NICU setting this might include dimming or turning off the lights in the nursery, and reducing or eliminating unnecessary noise such as the constant sounding of monitors, loud conversation, or music from the radio. If it is not possible to turn off the lights, the infant's bassinet can be partially covered with a blanket. If environmental noise cannot be regulated appropriately, it is sometimes possible to move the infant to another, quieter room. During acute times of autonomic disorganization, the therapist can also act on the infants's behalf to delay minor medical procedures (such as drawing blood from the infant's heel for testing), and help to minimize impersonal handling of the infant by staff.

Another important "environmental" intervention, and one that we were just recently able to implement in our medical setting, is to allow "on demand" feeding for these newborns, unless medically contraindicated. I

believe that this is a significant intervention, since it allows the infant to begin to self-regulate his own hunger-satiation cycles. An infant who presents with autonomic regulation can be much helped by a prompt and accurate response to his cues for food. As with other successful cue-response interactions, through this process the infant can "learn" to trust both his own signals and the responsivity of the environment.

As is true for the infant's behavior in all the developmental realms, the clinician needs to be sensitive to the infant's cues, and must observe and assess the need and level of intervention to be provided for the individual baby. In my work I have not developed a list of specific interventions that resolve specific symptoms, such as excessive sneezing, yawning or hiccoughing. However, I have found that 'simple holding' (as is described below) is quite effective in promoting organization in the autonomic realm for opiate-exposed infants. I believe that the function of this kind of holding serves to strengthen the baby's autonomic processes which, in turn, will assist with the management of specific presenting symptoms.

Simple holding is characterized by secure, sufficiently firm physical holding that encompasses the infant in a slightly flexed position. Holding an infant as close as possible to one's own body is especially effective, in that the infant can learn from, "borrow" the clinician's steady heartbeat, breathing, relaxed muscle tone and emotional projection of 'well-being' for his own

organizational tasks [63, 64]. When holding an infant in this way, it is important for the clinician to be conscious of her own physical state, and to provide for the infant a calm, supportive, relaxed and organized "holding environment."[65] During this holding, it is of great importance to be patient with the infant, and not to present demanding interactional tasks that will draw him "outward" prematurely. For example, excessive stimulating verbalizations, specific tactile stimulation or repeated attempts at eye contact are usually not conducive to the infant's attempts at organization in the autonomic realm.

While the skills involved in facilitating the opiate-exposed infant's organization in the autonomic realm are not inherently complex, they do involve a great deal of specific observation of infant cues, consciousness of one's own senses and actions, and the clinician's ability to use her different sensory modalities in a selective manner. Further, the environmental variables of the medical setting which include an overall highly stressed, "fast" environment, bright lights and lack of "normal" diurnal rhythms, noise, unpredictable medical procedures and often impersonal caregiving are a further challenge to providing effective developmental intervention in this

[63] Although skin-to-skin contact is most likely ideal to promote basic organizational processes in a disorganized newborn, this is not possible for the clinician in a traditional medical setting. However, all these intervention techniques can be taught to parents fairly easily, and skin-to-skin contact can certainly be encouraged.

[64] It should be noted here that even "just" holding does not necessarily presume a passive infant. In this case, the infant is being held in such a way that he can actively self-organize in the autonomic realm.

[65] There have been many occasions in my work with infants where I have observed that my own physical discomfort, nervousness or "disorganization" impacts immediately on the infant's behavior. Infants are superb at "picking up" others' physical and emotional states, and while this can be used to their advantage in the intervention process, it can conversely also impact in a negative manner. This issue is key in teaching others to provide developmental intervention, and often becomes a major part of the clinician's work with an anxious, tense parent of a drug-exposed infant.

realm.

Autonomic Functioning of Cocaine-Exposed Infants: A Clinical Dilemma

Cocaine-exposed infants present less predictably in the autonomic realm and may show some, all or none of the above symptoms (Dixon, 1994). Cocaine-exposed infants who present with signs and symptoms of autonomic disorganization similar to those described for opiate-exposed infants seem to respond well to the interventions described. However, many cocaine-exposed do not present with the breadth and apparent severity of symptoms described for opiate-exposed infants.[66] In fact, were one to assess their organization in the autonomic realm through the presence of symptoms alone, cocaine-exposed infants might appear quite "organized." However, if it holds true that organization of the autonomic realm should be assessed not only by actual symptoms such as sneezing, sweating and so on, but is also reflected in the infant's developmental "readiness" for external stimulus, then what of the autonomic organization of cocaine-exposed infants who very often present in a sleepy, depleted manner?

Is their "turning inward" behavior a sign of autonomic disorganization[67] and, if so, what may be appropriate interventions for this group of babies? Whereas it appears clinically indicated to promote a "turning inward" process in infants going through withdrawal, in order to facilitate greater autonomic organization, is it indicated to support this "turning inward" for an infant for whom this is his primary state of being? Is

[66] In my own clinical experience, I have found that a common symptom of disorganization in the autonomic realm for cocaine-exposed infants is tremors of the upper extremities.

[67] Or, is their excessive "turning inward" a result of state disorganization? This issue will be explored further in a later section.

the infant sleeping so much because the results of intrauterine cocaine exposure make this a homeostatic requirement, and if so, what are the tasks of developmental intervention in this regard? This remains an area for active exploration in my clinical work at the present time.

The Motor System: Characteristics and Interventions

Broadly speaking, the organization of the very young infant's motor system concerns his evolving and continually adapting relationship to gravity. The normal state of the newborn is one of physiological flexion, and is only gradually modified by the development of extensor tone. The newborn's first movements consist of a host of primitive, survival-oriented reflexes, which combine and modulate to result in increasingly coordinated, functional and complex movement patterns. The infant's muscle tone and quality of his overall movements are a reflection of this process.

The overall goal of interventions in this realm is to promote and strengthen normal behavior and organization. As was seen in Chapter 2, this specifically includes the facilitation of physiological flexion, modulated tone and functional reflexive behavior, resulting in smooth and organized movement responses. In our discussions of normal development we saw that early motor organization is to a great degree dependent on autonomic regulation (Als, 1979, 1982). Therefore, the interventions in this realm also include interventions appropriate to the facilitation of autonomic regulation. For example, environmental interventions such as reducing bright lights and other stimuli, "on demand" feedings, and 'simple holding,' as discussed earlier, form the background of, and are included in interventions specific to the motor realm. However, additional skills are necessary to provide

effective intervention in the motor realm, and they are more technically complex than the interventions required to promote autonomic regulation in very young infants. Effective interventions in the motor realm require a good working knowledge of early sensori-motor development, and the many ways in which this is actually manifested in both a 'normal' and 'disorganized' newborn. Interventions in this realm requires skill and experience in the actual holding, handling and positioning of a baby.

Normalizing Muscle Tone

The modulation of muscle tone is a main area of difficulty for both opiate- and cocaine-exposed very young infants. Infants going through withdrawal usually show an increase in tone (and especially extensor tone) that ranges from slight hypertonicity to actual rigidity of the limbs (Zuckerman and Brown, 1993, TIP manual, 1993, Kandall, 1991). For opiate-exposed infants, this hypertonicity usually appears equally distributed through the body, and usually decreases with pharmacological treatment and appropriate handling and positioning over time. Our observations have shown that cocaine-exposed infants often present with uneven tonal distribution, characterized by hypertonicity in the extremities and with a tendency for hypotonicity in the trunk. Further, the tonal distribution of cocaine-exposed infants is rather unpredictable and often fluctuating - for example, an infant may make an overall "floppy," low-tone impression in the morning, but can present in a hypertonic way only several hours later, and vice versa. The uneven and fluctuating muscle tone of cocaine-exposed infants often makes them quite difficult to assess and to plan for appropriate treatment. Due to their typically quite limited length of stay (7-10 days) in the

medical setting, and the resulting limited opportunities for observation, assessment and intervention, the clinical resolution of this issue is not yet clear.

As reviewed in Chapter 2, muscle tone is a reflection of that infant's felt or experienced relationship with gravity (Bainbridge-Cohen, 1993, Fiorentino, 1981). A hypertonic infant is "overcompensating" to the pull of the gravitational force, and conversely, a hypotonic infant is exhibiting his difficulty in overcoming gravitational demands. In other words, and put simply, both hyper- and hypotonic infants are receiving somewhat inaccurate "messages" from their nervous systems regarding the relationships of their bodies in space and in relation to the gravitational pull. It is an important aspect of the intervention to give the infant slightly different "messages" in the form of selective sensory experiences, thereby assisting him to form more appropriate motor responses. It is this process which, in my mind, makes up active sensori-motor learning in this realm.

The interactive role of both the infant's and the clinician's emotions and affective expressions cannot be underestimated for interventions in this realm, and in my own clinical work I have found that there is a strong and consistent correlation of muscle tone with both state behavior and affect. That is, a hypertonic baby is also usually an irritable baby, and one who spends a disproportionate amount of his time in a crying state. Hypertonic babies in distress convey a sense of their own panic and terror, as evidenced in their facial expressions, movements and in the quality of their cries. Infants whose tone is uneven or fluctuating present as passive, disinterested and depressed when in a resting (drowsy) state, and when roused, present in an irritable, agitated and defensive manner. Since physical and emotional experience are

so interwoven for the young infant, and touch communicates affect so powerfully, this area is key for intervention. The "messages" that the clinician communicates to the baby are inherently physical as well as emotional.

Specific techniques with both hyper- and hypotonic infants include, first and foremost, prompt and effective responses to their behavioral cues. Among the most important interventions are prompt soothing in response to irritability, prompt feeding in response to hunger, and slow, predictable, secure and firm holding and handling[68] . Stress always functions in a disorganizing manner. For a hypertonic infant in particular, stress activates and escalates his overall tone, whereas soothing and comfort decreases muscle tone. That is, an infant's frantic motor responses are effectively met with a calm, reassuring, confident touch. Overall, the infant is held, carried and physically interacted with in such a way that he can experience his own weight and mass as securely supported by another. The infant's extra sensitivity to fast movements is also taken into account, and defensive reactions are minimized by slow movements through space. In a sense, the interventionist is modifying and "translating" gravity to the infant, in measured doses, and within the infant's present realm of functioning.

During this process, the clinician is all the time monitoring the infant's responses, and is particularly sensitive to observing if and how the infant is a participant, that is, whether he is able to "integrate" the movement experience as a whole. If an infant is observed to react defensively or to "shut down" and become passive or conversely, to become irritable or agitated, the

[68] 'Secure' handling means especially the facilitation of flexion and proper head support. Both these tasks can be challenging with motorically disorganized infants.

clinician stops or modifies the interaction and does whatever is indicated in order to regain the infant's active participation[69].

Intervention for both hyper- and hypotonic infants in this realm of functioning rests on the same theoretical foundation, and is informed by the same movement principles. The main differences in intervention in the motor realm for hyper- and hypotonic babies have to do not so much with what actions are taken, but more specifically with the quality of the clinician's touch. Whereas the hypertonic infant needs less "specific" touching and more overall holding, and calming of responses, the hypotonic infant (or the infant with uneven and fluctuating muscle tone) requires a more precise and stimulating touch and attention. As hypotonicity reflects a difficulty with responding to the earth's gravitational pull, intervention in this regard consists of physical interactions which, in measured doses, strengthen that infant's anti-gravitational responses.

The sensori-motor "messages" and learning inherent in this process for the infant have to do with his felt experience of normal functioning. Prompt responses to his communications for food or physical closeness reinforce his general sense of well-being and effectiveness as a communicator, and the quality of physical interactions described above allow the infant to be temporarily freed from his proprioceptive and vestibular defensive reactions, and his body and movements can be experienced as both effective and pleasurable. Along with, and interwoven with the above, the emotional "messages" of the physical interactions with the baby may translate as something like this: "I see you. You are safe. I am strong and I can take care of you. The world is a good, safe place." It is a hypothesis of this intervention

[69] Again, this is in support of the view that nothing is gained by doing anything "to" the infant, and that sensori-motor learning is a participatory, active process.

that these repeated experiences, in conjunction with the infant's own constitutional "self-righting" and "self organizing" (Sameroff, 1975) mechanisms, contribute to support normal developmental outcome.

Facilitating the Integration of Primitive Reflexes

The organization of primitive reflexes is an area of difficulty for most drug-exposed infants. Early motor skills are dependent on coordinated reflexive responses (Fiorentino, 1981, Bainbridge-Cohen, 1993), and drug-exposed infants' behavioral disorganization in this area manifests in their whole movement responses: jerky, uncoordinated and frantic movements, exaggerated or depressed responses to vestibular stimulation, as well as inefficient feeding patterns can be seen in both opiate-and cocaine-exposed babies.

Opiate-exposed infants going through withdrawal usually are hyperreflexive (TIP manual, 1993), which means that the normal reflexive responses appear in an exaggerated manner. In my own clinical work I have found that especially the rooting, grasping and Moro reflexes are so affected in these babies, reflexes whose survival value is related to the fundamental tasks of self-nourishment and of holding on to another. For example, the slightest stimulation on an infant's cheeks (especially during feeding, but often also when the infant does not appear to be hungry), may produce frantic turning responses of the head, and a quick shift of the baby in one's arms may elicit a full-blown falling response in the form of the Moro reflex.

In my experience, cocaine-exposed infants may also show an exaggerated grasping response, and their rooting reflex appears affected as well. However, unlike opiate-exposed babies, cocaine-exposed infants may

not show a great deal of responsivity to an actual rooting stimulus. For example, a cocaine-exposed infant may be observed to root in an exaggerated manner while in a drowsy state, in response to no external prompting. As cocaine-exposed infants do not present in a clear hypertonic manner, they also do not appear in a clear hyperreflexive manner. Overall, like their tonal distribution, their reflex behavior is very complex, uneven and fluctuating: some of the time they may present with exaggerated reflexes, and at other times it may be difficult to elicit an appropriate reflex at all.

For the neonate and very young infant, efficient feeding requires the coordination of breathing with the rooting, sucking, and swallowing reflexes, and presents a common area of difficulty for drug-exposed babies. For the opiate-exposed infant, and especially during the early stages of the withdrawal process, disorganization in this area may be so severe that he will be fed via a naso-gastric (NG) tube. In addition to an exaggerated, frantic rooting response, this infant may exhibit tongue thrusting, poor "latching on" (lip closure around the nipple), a weak suck and gagging responses. The infant's suck may also be so strong and unmodulated that he is caused to cough and gag as a result of this, or he might vomit after every feeding. Cocaine-exposed infants may also exhibit difficulties in the feeding realm (Beeghly and Tronick, 1994): sometimes these infants exhibit poor lip closure and a weak suck, at other times an urgent, strong, and rather unmodulated suck[70].

The goal of clinical intervention is to help the infant normalize his reflexive responses in order to facilitate their integration into simple,

[70] While their feeding coordination as a whole does not appear as motorically disorganized as that of the opiate-exposed infant, the cocaine-exposed infant's lack of alertness and apparent lack of interest in the caregiver during the feeding process is striking. This issue will be explored in greater depth in the following section on state organization.

functional movements. In the case of babies presenting with disorganized reflexive responses, the clinician's task is two fold: first, keeping in mind that reflexes are part of that infant's first communications, the normal "message" of a reflex should be assessed, before "treating" it as a symptom. This is a prerequisite to the second task, that of facilitating normalization of the response through environmental and hands-on facilitation.

In regard to the first task, the clinician must ask: "What is the infant communicating, or what is the "meaning" of this reflex?", "Why is he communicating in the way in which he is communicating?" For example, we have discussed the drug-exposed infant's irritability and need for self-regulation, and have also seen that the rooting reflex is often hyperactive in these infants. An analysis of the function of this reflex reveals that it serves as an initiator for the latching on and for sucking responses. We also know that sucking is one of the self-regulating behaviors that an infant has at his disposal. Therefore, perhaps this infant is communicating, to the best of his ability, an increased need to suck in order to self-regulate[71].

The question inherent to our second task with the infant may be: "What can I do to provide what he needs in this situation?" In the above example, an important part of the intervention is to provide sufficient opportunities for sucking. Frequent, "on demand" feedings and the "as needed" use of a pacifier are common examples of this. In addition to the above, another part of the intervention is to help normalize the exaggerated reflexive response by recognizing the infant's great sensitivity, and thus, to

[71] This is another example of how important a normal developmental perspective becomes in "treating" behaviorally disorganized infants. Rather than automatically labeling their responses as pathological, we must carefully examine their active initiations, and work to uncover what is functional and healthy in their responses.

reduce sensory stimulation in this regard. In hands-on work with an infant, stimulation can be modified in an individualized way to decrease the exaggerated response[72].

Another example can be found in many drug-exposed infant's exaggerated clinging and Moro responses. These can either be interpreted in a pathological manner, or it can be presumed that perhaps the infant, through his reflexive behaviors, is 'communicating' his increased need for both "holding on," and "being held" (Winnicott, 1960). Interventions in this regard should therefore provide many opportunities for "holding on," (to the clinician's fingers, clothes, etc.) as well as for "being held." In this regard it should be remembered also that the infant's experience of being "held" depends on his ability to integrate the sensory input. Slow, predictable movements, and a reduction of sudden vestibular stimulus therefore appear indicated. Finally, the clinician's task is to facilitate a decrease in muscle tone (in the manner described earlier), since increased muscle tone fuels the exaggerated clinging and Moro responses.

A further intervention in this realm involves the stimulation of missing or weak reflexes, in order to facilitate normal movement responses. It is a principle of normal development that efficient movement consists of the coordination of a number of reflexes, and that within that coordinated response, reflexes occur in a sequential progression (Bainbridge-Cohen, 1993). For example, the feeding process involves the coordination of the rooting, sucking, and swallowing responses, and one logically follows the other. This understanding is an important foundation when providing intervention to

[72] This is an important area of intervention with both nursing staff and parents. A caregiver, frustrated by an infant's uncoordinated feeding pattern may begin to "wiggle" the nipple in a sideways manner in the infant's mouth, thus exacerbating his hyperreflexivity.

babies who exhibit problems in this area.

When presented with such a baby, the clinician must ask not only "What are this baby's difficulties in coordinating these reflexes?", but also, "Which of these necessary reflexes is absent or weak, and how is this impacting on the total feeding pattern?" In a physical examination of each of the contributing reflexes in a distinct manner, the clinician can determine where her intervention will be most successful. For example, a poorly feeding infant may be feeding poorly because his rooting reflex is weak or missing. This reflex can be stimulated and elicited through repeated and selective stimulation at the side of the mouth. Or, an infant may have trouble with his sucking reflex, and this reflex can be elicited as modulated as well by the clinician. There have been several occasions in my clinical experience where a poorly feeding infant was able to master this challenge by eliciting one or the other weak or missing reflex.

The State System: Characteristics and Interventions

It will be remembered from Chapter 2 that the state system refers to the infant's level of alertness at a given moment, and the states discussed in this work are especially relevant for the neonatal period. To review briefly, the six states as outlined by Brazelton (1989) include, (1) deep sleep; (2) active REM or light sleep; (3) drowsy; (4) wide awake or quiet alert; (5) active awake, and (6) crying. While it must be remembered that there exist individual differences among infants in the organization of their state behavior (Escalona, 1976), it is thought that normal state behavior of a newborn is characterized by the availability of the full range of states, by functional transitions between the states, and by a progressively and increasingly

differentiated alert state, the expressions of which make up the attentional/interactive system[73] (Als, 1979, 1982). While state seems in large part to be a reflection of the early organization of the nervous system, it can be clinically interpreted to signify the infant's ability to "make choices": to seek and invite, to shut out stimuli, and to mediate smoothly between his "inner" and "outer" focus.

In discussing disorganized state behavior for the population of drug-exposed infants, several points should be kept in mind: it must be remembered that there are individual differences among all infants (Escalona, 1976, Thomas and Chess, 1977) and that this holds true for drug-exposed babies as well; that exposure to different substances seem to produce different kind of difficulties; that the hospital environment and lack of consistent personalized care may impact on this area as on the other realms discussed previously, and that not all drug-exposed infants experience the difficulties described below. Overall, my clinical experience indicates that many of cocaine- as well as opiate-exposed babies exhibit a variety of difficulties with state regulation, and that for both groups, the main areas of disorganization consist of a) lengthy periods of time spent in extreme states (deep sleep or crying), b) rapid and poor transitions between states, and c) difficulty achieving and maintaining a quiet alert or wide awake state, which in turn impacts on their abilities for interactive, and especially for visually interactive behaviors.

Opiate-exposed infants going through withdrawal tend to spend a great

[73] Since the majority of infants with whom I work at the NICU are younger than 6 weeks of age, and therefore find themselves developmentally just before the "Two Month Shift" as described in Chapter 2 (Emde and Buchsbaum, 1989), the attentional/interactive realm as described by Als (1982,), with its focus on increasingly mature visual interaction, as well as social smiling and cooing behaviors, will only be discussed in a limited way, and as part of the present section on state organization.

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deal of time in a crying or active alert state, and when calmed, may suddenly "fall" into deep sleep. An opiate-exposed infant may also have a great deal of difficulty reaching deep sleep at all: disorganization in the autonomic and motor realms may impact visibly here, and the infant's light sleep may be punctuated by sudden startles, twitches or tremors. Clinically, it appears that the opiate-exposed infant is struggling to regulate chronic sensory over-stimulation, and even when in a wide awake state, an opiate-exposed infant may shut his eyes or turn his head when approached directly. Medications used to facilitate the withdrawal process further impact on the infant's state behavior.[74]

While there is no one profile for the cocaine-exposed infant and no established "withdrawal syndrome" that follows a semi-predictable pattern, it has been my clinical experience that the majority of cocaine-exposed neonates present in a sleepy, lethargic manner. In contrast to opiate-exposed infants, these babies spend the majority of time in one of the sleeping states or in a drowsy state[75]. Similar to opiate-exposed babies, these infants have difficulty transitioning between states, and tend to become quite irritable when roused.

[74] Pharmacological effects are often positive, and help to normalize regulation in this realm. For example, medication often calms an hyper-irritable infant, and enables him to reach a deep sleep state more easily and for longer periods of time. On the other hand, medication may also make an infant exceedingly drowsy at times, or help to produce a "spaced-out," kind of look while in a wide awake state. Clinically, it also appears that different medications produce different kinds of state-related effects. Finally, the important impact of individual differences, and possible individualized responses (Thomas and Chess, 1977, Escalona, 1976) to pharmacological treatment should be considered here as well.

[75] The contrasting behaviors of opiate-and cocaine-exposed infants in this realm can be explained by the effects of different types of exposure. Simply put, opiates have a depressant effect on the mother, and on the growing fetus as well. When the infant is born, he is no longer receiving this drug and his nervous system responds with hyperirritability - thus withdrawal. Cocaine on the other hand has a stimulating effect, and when this substance is suddenly withdrawn, the infant responds in an exhausted, depleted manner. As mentioned earlier, while opiate-exposed infants often receive medication to modulate the withdrawal process, and are slowly weaned from this medication, pharmacological intervention usually does not appear medically indicated for cocaine-exposed infants.

A wide awake state seems difficult to establish and to maintain, and within this state, repeated gaze aversion and head turning can appear as a quite dramatic "rejection" of their social partners.

Broadly speaking, interventions in this realm are geared toward facilitating the neonate's improved ability to make adaptive use of a wide range of states, to facilitate increasingly smooth transitions between the states, all with an eye towards facilitating increasingly lengthy and functional quiet alert states that can be used for qualitatively new types of interaction with a social partner. As organization in this realm is dependent on autonomic and motoric regulation as well (Als, 1979, 1982), interventions are necessarily carried out in conjunction with the interventions discussed in the previous sections.

Normalizing Extreme State Behaviors

A main goal of intervention for the opiate-exposed infant has to do with decreasing and helping to modulate his hyperirritability, as evidenced in prolonged crying and active alert states. As in the autonomic realm, interventions in this realm include preventive environmental modulations, such as decreasing excessive light, noise and so on. In addition, facilitating personalized care becomes a key issue for this infant, as the primary intervention in this realm (as in the other realms) consists of prompt and accurate responses to the infant's cues. Consistent responses to the infant's need for physical closeness or food serve to limit the escalation of his irritability and help him to self-organize in increasingly appropriate ways. Soothing, in all its various and individualized forms is a main intervention in this area.

As has already been discussed, cocaine-exposed infants present in a different manner. In regard to interventions, whereas it appears clinically straightforward to soothe a hyper-irritable infant who is obviously in a great deal of discomfort, it is less clear that a sleeping infant should be roused from sleep, even if the sleeping behavior appears excessive. It has to be kept in mind that the infant's sleepiness may be a normal and necessary biological response to intrauterine cocaine exposure, and decisions to rouse an infant must be considered carefully. As both clinical and medical information is minimal in this regard, the clinician needs to explore openly, should rely heavily on close observation of individual infants, and also closely observe the effects of specific interventions. In my own clinical work with cocaine-exposed infants I find that I usually spend one or more days observing the infant's state cycles, and that my interventions are not so much geared toward changing the overall pattern (with its emphasis on sleep), but rather on helping the infant transition between states, an area that is explored in greater depth below.

The above is an area that remains problematic in my clinical practice, and is compounded by the fact that cocaine-exposed infants in general demand attention less frequently and less passionately. As I have stated previously, these infants are frequently referred to by nursing staff as "the good babies," since they tend to be minimally demanding, only waking for feeds. As a clinician in an intensive care unit I frequently find myself in a position of having to "choose" between attending to one or another baby. Most often, the infant in the most obvious distress receives my immediate attention, and I think that other staff respond similarly. The overall result may be that cocaine-exposed babies receive less personalized attention and

intervention over time[76].

Facilitating Transitions Between States

Another goal of intervention is to facilitate increasingly smooth transitions between states. Clinically, I believe that rapid state transitions may be the result of a quick and successive battery of poorly differentiated stimuli that momentarily overwhelm the infant and cause him to respond in an extreme manner. My clinical observations indicate that rapid state transitions often follow a lengthy period of time spent in an extreme state, and therefore decreasing extreme states as described above is the first step toward achieving the present goal. Also, facilitating increasingly smooth transitions between states can be accomplished by helping to regulate an infant during the transitions, by "being with" him, closely observing behavioral cues, and helping to differentiate stimuli by responding to his cues momentarily.

For example, an opiate-exposed infant waking from deep sleep can be picked up and out of his crib before he suddenly "realizes" that he is terribly uncomfortable and escalates into crying. His waking cues can be responded to progressively, and the interventionist, through holding and other various responses, can initially function as a kind of "bridge" for the infant between states. Conversely, in regard to transitions from waking to sleeping, it appears that a key factor influencing rapid transitions has to do with overstimulation in the waking state. As will be discussed further later on, it is important to modulate sensory input during the awake states, in order to limit a sudden "shutting out" of stimuli by the infant. Here again,

[76] Anecdotal reports indicate that cocaine-exposed toddlers and young children often present in a "hyper," restless manner. I have often wondered whether this may be partially due to the lack of early opportunities in regulating state behaviors, specifically in regard to a lack of experience with modulating non-sleeping states.

unmodulated transitions can sometimes be prevented by "being with" an infant throughout the entire process, by observing closely, and by responding to cues progressively.

Another frequent difficulty for opiate-exposed infants is reaching and maintaining a deep sleep state. Deep sleep is crucial for rest, growth and overall neurological development, but many of these babies spend lengthy periods of time in light sleep, punctuated by continuous tremors and startles. Their inability to reach deep sleep in turn contributes to their increased irritability and sensitivity to stimuli when fully awake. In a busy hospital setting, an infant is often returned to his crib immediately after feeding, when he might be in a drowsy or a light sleep state. Infants with this kind of state disorganization appear to need a "regulating other" in this regard, and in this case a simple and effective intervention is simply to hold an infant until he reaches a deep sleep state.

It is common that when roused, a cocaine-exposed infant will present in an irritable manner. Therefore, if the decision is made to wake an infant out of deep sleep, it should be done in such a way that circumvents extreme reactions such as irritability. This is done by introducing stimulus slowly, and helping an infant process his reaction before introducing new stimulus. For example, a first step in rousing a sleeping infant may be to lean over his crib and begin to speak softly to him. At first there may be no reaction at all, and after repeated trials, perhaps there will be a twitching of the eye, mouth or limbs. Following this, perhaps the clinician will add another stimulus, lightly placing a hand on the infant, while continuing to speak in a low voice. Again, the clinician will wait for the infant's response, and when he appears to have integrated both these stimuli, the clinician might then slowly pick the

infant up and out of his bassinet, holding him close to her body. Again the clinician waits until this action is integrated by the infant. Perhaps at this point the infant will have transitioned from deep to light sleep, and the clinician might now encourage further waking by holding the lightly sleeping infant in the "en face" position, perhaps unwrapping his blankets, introducing a slightly firmer, more "alert" hold, and continuing to speak with him in an inviting manner. This step-by-step process can be continued in various ways, until the infant has reached a wide awake state. Again, what is important here is that the process of transition is gradual and slow, and that at each level of the intervention, the clinician is alerted to the infant's ability to process the changing and added stimuli. If at any point the infant seems overwhelmed, as evidenced in "shutting down" or in a variety of defensive reactions, the clinician must "backtrack" and decrease stimuli, or introduce more appropriate stimuli. It should be understood that such an intervention usually takes a considerable amount of time.

I believe that facilitating appropriate state transitions and the "bridging" described above may be clinically significant, since it allows the infant to begin to actively process his sensations in a step-by-step manner, and in manageable doses. It can be seen that intervention in this realm again relies heavily on the concept of the infant as an active participant in his own development and management of his organizational tasks. That is, I believe that it is the infant's ability to actually *experience* the various transitions in an increasingly organized manner that provides the foundation for normalized functioning in this and other areas.

Facilitating Quiet Alert States and the Attentional/Interactive System

As we have seen, cocaine- and opiate-exposed infants present in quite different ways: whereas opiate-exposed infants have a tendency towards hyperirritability, cocaine-exposed infants have a tendency for sleepiness and lethargy. However, the common factor for both these groups is their difficulties with attaining and maintaining a quiet alert state. A quiet alert state is thought to be the optimal state for infant "learning," and requires of the infant to be able, at chronologically increasing increments, to turn his attention "outward," to take in new and different stimuli, and to interact with these outside events.

Relatedly, the attentional/interactive realm is directly dependent on the infant's ability to attain and maintain a quiet alert state (Als, 1979, 1982), and to use that state as a foundation for interaction with his social partners. As was discussed in Chapter 2, a culmination of this ability can be seen at the time of the Two Month Shift (Emde and Buchsbaum, 1989), when the infant's neurobehavioral organization seems to make a qualitative developmental leap, and begins to have a more marked exogenous, rather than endogenous focus. According to Als (1982), organization in the attentional/interactive realm includes abilities such as initiating and sustaining visual contact in interaction, beginning vocalizations (gurgling or cooing) and smiling responses.

The attainment and maintenance of a quiet alert state presupposes, at least for a short period of time, that an infant be free from disruptive disorganization in the autonomic, motor, and state realms. Therefore, the facilitation of a quiet alert state consists of the combined interventions in the other realms of behavioral organization, and conversely, the success of interventions in these other realms can be clinically measured by the infant's

ability in maintaining and sustaining a quiet alert state. That is, as a clinician I do not attempt to elicit a quiet alert state directly. Based on the notion that the infant is active and stimulus-seeking (Piaget, 1952), I believe that if my other interventions are successful and the infant is able to function in an increasingly organized manner, he will naturally attain and use the opportunities inherent to quiet alertness.

Especially in the earliest weeks of life, the drug-exposed infant may be exceedingly vulnerable in the quiet alert state. That is, he may be easily overstimulated and may "shut down" after several minutes of active, and especially visual interaction. This can be seen quite dramatically in the "gaze aversion" behavior of many cocaine-exposed babies. In a different situation, an infant may appear to be maintaining a quiet alert state for a lengthy period of time, continually eliciting adult interaction with his gaze, facial expression and even some cooing. This same infant may suddenly become quite irritable and difficult to console, and I believe this may be a sign of his difficulty with modulating the type and amount of incoming stimulus.

An important intervention in this realm therefore is to observe the infant's initiations for interaction closely, and to gage our own type and intensity of response, in order not to overwhelm the infant with premature and perhaps overwhelming stimulus. For example, while feeding an infant, he may look in another direction or keep his eyes closed altogether. After several minutes, this infant may open his eyes or shift his gaze to the caregiver's eyes. Perhaps this signifies a readiness for visual relating, in which case the clinician can respond in like, all the while taking his "cue" from the baby's actions. On the other hand, a visual response from the clinician may cause the infant to avert his gaze again, and so she must retreat,

perhaps speak invitingly to the infant, but be content only to be "looked at" for a little while.

Current theory (Als, 1982) emphasizes vision as one of the main tools for early social interaction, but it should be kept in mind that organization in the attentional/interactive system also includes more primitive (and chronologically earlier) abilities such as molding to the caregiver's body, alerting to the caregiver's voice, decreasing motor activity while attending to the caregiver's voice, and the ability to be soothed - all tasks that speak to the infant's emerging ability and skill in being related to an 'other'. While it is correct that many drug-exposed infants have difficulty attaining and maintaining a quiet alert state in the early weeks, and often become overstimulated with visual interaction, this does not mean that they are not or cannot be well related to a caregiver. For example, while an infant during the feeding process may not be engaging an active visual exchange with the caregiver, he may be molding well and in a relaxed manner to the caregiver's body, or be grasping the caregiver's finger, and this must be recognized and responded to as an interactive behavior as well.

Conclusion: Intervention and Early Emotional Development

At this point in time, our understanding of neurobehavioral organization and the complex interrelated functioning of each of the realms is quite detailed and sophisticated, and our knowledge in this area is extremely useful in regard to understanding the infant's primitive "language" and in planning for appropriate interventions. However, as clinicians we must also be interested in the infant's subjective experience. With this in mind, we could ask: What does neurobehavioral organization

actually mean to the infant?

I think that the answer to this is quite simple, and entails the understanding that the earliest physical sensations and experiences, be they comfort, discomfort or homeostatic imbalance 'translate' into emotional experience for the baby at this early stage. That is, when organization is overall smooth and the environment is able to act successfully as a "regulating other," the infant feels "good" and "safe" and "held," can successfully manage some of his early emotional challenges, and thereby the way is paved for the emergence of his "true self" (Winnicott, 1960). On the other hand, an infant experiencing severe and persistently disruptive signs of neurobehavioral stress (be it tremors, startles, exaggerated reflexes or intestinal cramping), or impersonal, insensitive touch and handling or inconsistent responses to his cues, may as a result experience emotional distress of great severity, akin to Winnicott's (1960) descriptions of the "unthinkable anxiety" resulting from a failure of "holding." Therefore, while the interventions described in this chapter have specific relevance for the neurobehavioral organization and sensori-motor integration of the very young infant, it must be understood that, just as importantly, they are designed to provide "holding," for the infant, and are aimed at facilitating his early emotional processes.

In clinical work with infants, it is a simple fact that the infant's physical and emotional experience are intertwined, and that interventions function simultaneously in a physical and in a psychological way. For example, positioning a hypertonic baby in a flexed position does not only provide the infant with more comfortable physical sensations, but seems to calm the baby overall and increase his emotional sense of well-being. Or, responding

promptly to an infant's need to be fed or held, does not merely function to still his hunger or warm his body, but communicates to him that he is effective in his initiations and that he is loved. As a clinician, one also frequently encounters striking examples of "unthinkable anxiety" (Winnicott, 1962) in infants, as when an unattended baby's cries escalate into panic, or when an infant with a hyperactive Moro reflex stares in terror, arms spread wide and trembling as if "falling for ever" (Winnicott, 1962). In these situations, the holding, soothing, speaking and proper handling of the baby assume great psychological importance.

Finally, what I have described so far, and the main focus of the present work speaks to the immediate clinical tasks of "holding." While I believe that these immediate interventions benefit the infant, a "good-enough" holding environment goes beyond intervention "sessions" with an empathic clinician, and should include consistent, personalized care "throughout the day and night," by caregivers who can provide "a high degree of adaptation" (Winnicott, 1960) to the infant. Perhaps most importantly, the infant requires parents, or similar attachment figures who can love, and be available to be loved passionately. While the clinical interventions discussed in this chapter are insufficient for the infant's total experience of a "holding environment," they directly inform other main areas of this NICU-based, early intervention effort, including developmental intervention with parents, with the parent-infant dyad, as well as with the infant's primary treatment providers.

CONCLUSION

Summary and Major Themes

This paper has been concerned with a study of key principles and processes of normal development in the first two to three months of life, and their application to early intervention with drug-exposed neonates in a medical setting. This work is the result of both theoretical studies and clinical practice, and represents the active relationship between these two realms. The discussion of normal developmental theory has been informed by clinical practice, and the concept of the "whole" infant - active, interactive, feeling and sensuous- has been highlighted. Conversely, in describing and illustrating clinical interventions with drug-exposed infants, the importance and effectiveness of utilizing normal developmental principles to facilitate early behavioral organization and emotional development has been discussed.

The main themes of this work concern the very young infant's body: the primacy of the body and the senses are highlighted for this period of development, and their essential interrelatedness to other developing "domains of functioning" such as the cognitive, social and emotional realms is explored. The very young infant's body is postulated as the medium for his receptive and expressive abilities, as his way of "listening," "hearing" and "speaking." Further, a related main theme of this work concerns the caregiver or clinician, her ability to perceive and honor the very young infant's body-based existence and early "language," as well as her ability to communicate in a sophisticated manner in this early and primitive realm of the senses.

The preceding chapters have addressed the above themes, each with a particular focus of their own: Chapter 1 provided a philosophical foundation for the rest of this work, and here I argued that whether our roles are academic or clinical in nature, we must arrive at a clear and articulated perspective regarding the very young infant's humanness, sense of self and capacity for subjective experience. A major proposition of this chapter was that the very young infant is a human being with an "emerging" sense of self (Stern, 1985), with a capacity for subjective experience, and I further proposed that our difficulties in arriving at a clear perspective in this regard is very much tied up with our own culturally-based prejudices regarding the infant's primitive, body-based functioning. Specifically, that our denigration and isolation of the "physical" creates conflict in our view of the very young infant, who literally "embodies" what we have rejected as being an essential aspect of our own humanity. In this chapter I concluded that our answers to these questions remain elusive, and that unarticulated, largely unconscious assumptions still dominate our discussions.

Chapter 2 outlined and examined several key principles and processes of normal development in the first two to three months of life, which served to create a theoretical frame of reference for the rest of this work. A main focus of this chapter was the organizational model (Brazelton, 1989, Als, 1979, 1982), and the infant's early tasks of neurobehavioral organization in the various developmental domains or subsystems of neurobehavioral functioning. The primacy of the infant's body and his interrelated sensori-motor processes were evident in all the infant's areas of functioning, including the cognitive (Piaget, 1952), autonomic (Als, 1979, 1982), motor (Ayres, 1972, Bainbridge-Cohen, 1993, Connor, Williamson and Siepp, 1978,

Fiorentino, 1981), state (Prechtl and Beintema, 1964, Wolff, 1966, Brazelton, 1989, Als, 1982) and attentional/interactive (Als, 1979, 1982) domains.

Chapter 3 addressed the very young infant's emotional development, identified key tasks in this realm for the first two to three months of life, and examined what may constitute his subjective emotional experience. It was postulated that normal development in this realm is characterized by the infant's achievement of "basic trust" (Erikson, 1960), "ego integration," and the infant's "coming-into being" of his "true self" in the context of a good-enough "holding environment (Winnicott, 1960, 1962, 1963, 1964, 1965)." In this chapter the relevance of the body and physical experience are especially striking, and the psychological essence of the infant's physical experience was illustrated in the context of "holding" and related functions as described by Winnicott (1960). In this chapter it could be seen that for the very young infant, physical experience and emotional experience are one and the same, in that the caregiver's touch and handling is "translated" into emotional experience and emotions in turn are expressed through the infant's "language" of the body. The dire emotional consequences resulting from a failure of "holding" in these early weeks of life were also discussed, and underscored the importance of the caregiver's special physical and emotional availability for the very young infant.

Chapter 4 provided an overview of the special situation of drug-exposed infants. Varying medical and neurobehavioral effects of intrauterine substance exposure, as well as what is presently known regarding developmental outcomes were documented and discussed, with a main focus on the effects of opiates and cocaine. This chapter further addressed the special situation of hospitalized, drug-exposed neonates. While the issue of

the infant's body and the primacy of physical experience were not addressed directly in this section, it was seen that the main effects of intrauterine drug exposure are evidenced in these infants' behavioral disorganization, are primarily physical in nature, and express themselves in sensori-motor terms. Further, in the discussions of the special situation of hospitalized, drug-exposed neonates it was seen that in addition to their behavioral disorganization caused by intrauterine exposure per se, environmental variables also profoundly impact on the creation of a good-enough "holding environment" for these babies, resulting in a combination of sensori-motor and emotional difficulties. In all these ways, the primacy of the body, its interrelatedness to other domains of functioning, and the role of the environment in this regard were again underscored.

Chapter 5 described an approach to early intervention with drug-exposed neonates, implemented in the NICU of a large, urban teaching hospital. The main focus of this chapter concerned the process and content of clinical interventions with this population throughout their hospital stay. Rather than focusing on the "treatment" of the "patient's" symptoms, this intervention is characterized by its emphasis on facilitating the normal developmental path for these babies. In regard to this work's major themes, this chapter illustrates the baby's "language" of the body in the autonomic, motor, state, attentional/interactive and emotional realms, and also describes the clinician's necessary skills for, and participation in this body-based communication system.

Implications for Further Study: Theory and Practice

I believe that this paper raises several issues for further study, especially

in regard to theories of normal development, ongoing research on drug-exposed infants, as well as clinical practice and early intervention with the population of hospitalized, drug-exposed neonates.

Theories of Normal Development

This paper demonstrated that for the very young infant, the body is essentially intertwined with all other areas of early functioning, and that physical experience occupies a central position in the baby's early life. Specifically, we have seen that physical experience is key in the development of the very young infant's early subjective experience, and relatedly, to his developing sense of self. At this point in time, we have access to a great deal of information about the very young infant's body and the early meanings of his physical experience from various fields of study including psychoanalysis, developmental psychology, medicine and the neurosciences, early intervention, occupational and physical therapy, sensory integration and various other and newer movement therapies. However, a cognitive bias still dominates most fields, and this tremendous wealth of knowledge has not yet been integrated.

I believe that this integration will be important in several ways: To understand the early importance of the body and physical experience, and especially its relationship to emotion and to the sense of self will no doubt expand and refine our understanding of early infancy and relatedly also to clinical work with very young infants. Secondly, I believe that this theoretical integration may also influence our ways of thinking about the body and physical experience for older children and for our adult selves, thus shedding new light on our conceptualizations of development throughout the life

span. Lastly, I believe that the re-integration of the "physical" may foster in us a new understanding not only for the infant's early organization, but also validate the work of parents of a very young infant, who seem to understand all this quite well, and do their work "intuitively."

Research on Drug-Exposed Infants

This paper also points to the need for further and multidisciplinary research on drug-exposed infants, including but not limited to the neonatal period. This paper was concerned with the first two to three months of life, and during this period, a particular gap in our understanding concerns cocaine-exposed infants: while a great deal is known about the symptoms of withdrawal associated with intrauterine opiate exposure, the cocaine-exposed neonate's neurobehavioral symptoms have not been as clearly delineated and defined. This limitation impacts also on clinical practice, and continued and ongoing close observation and documentation should provide some answers to these questions.

Further, as most identified drug-exposed neonates are hospitalized for a portion of the neonatal period, the majority of information to date has been accumulated by professionals from the medical field, and in the context of a medical setting. I believe that there is a need for more extensive developmental and psychological observation of these babies. Specifically, I believe that an observational approach that focuses on early emotional responses and attachment behaviors is much needed for this population of babies, and may add to our understanding regarding the differential effects of drugs on the infants' behaviors in these realms.

Clinical Practice and Early Intervention

The clinical work described in this paper challenges a pathological approach to the treatment of drug-exposed infants, and applies principles of normal development to early intervention. Immediate questions arising from this work include the following: What is the actual effectiveness of this intervention? Does early facilitation of the normal developmental path help at-risk infants mediate their special circumstances, both in the neonatal period and beyond? What specific interventions seem to be most effective, and how could this be measured, given this intervention's lack of formalized "techniques" and individualized approach? Also, how do clinical interventions with the baby interact and combine with the interventions provided for the infant-parent dyad and for the drug-using mother? And finally, could a normative approach be generalized to intervention with other populations of at-risk infants? All these questions remain to be explored.

This paper has also raised a number of problems and questions specific to the situation of cocaine-exposed neonates. To begin with, much less is known regarding these infants' special challenges in the neonatal period, and this lack of information makes clinical interventions more exploratory and more difficult overall. Another problem concerns these babies' access to early intervention in a hospital setting: First, because cocaine-exposed neonates usually do not require pharmacological treatment, their length of hospitalization usually does not exceed a ten day period, and thus the potential effectiveness of hospital-based interventions are minimized. Secondly, it was seen that because cocaine-exposed infants tend to present in a sleepy and lethargic manner, they are often not attended to in the same way as holds true for opiate-exposed babies, who strongly elicit caretaking behaviors.

Finally, this work identified dilemmas in the context of an actual intervention session with these babies, and several main questions were raised: To what extent should a sleepy baby be brought to an alert, interactive state? What is the interplay and balance here between the need for biological "refueling" and alert behaviors that can be used to negotiate the social realm? These questions point to the need for increased theoretical and clinical attention to these issues.

What Remains Unspoken

Throughout this work, but most clearly in the actual illustrations of interaction and intervention with the babies, there is much that remains unspoken. While I have attempted to relay a sense of the quality of the physical interaction between infant and clinician, I am aware that this must be experienced and felt, rather than read, heard or talked about. What is actually happening for the infant and for the caregiver, on a physical, sensory, and emotional level, when a frightened, tremulous infant's body is held close against one's own? What does it feel like to stroke a baby's brow, to position him firmly into a flexed position, to gaze into his eyes? What does it feel like to hold a deeply sleeping baby? How can the various forms of "energy" exchanged while touching and being touched be communicated to a reader? While some of this can be captured through detailed and sophisticated description and analysis, I believe that the essence of touching and being touched, seeing and being seen, feeling and being felt must be experienced and lived, and has a separate and entire existence in a realm that lies outside of language.

REFERENCES

Ainsworth, M. D. S. and Bell, S. (1972). Infant Crying and Maternal Responsiveness. Child Development, 43, 1171-1190.

Alexander, R., Boehme, R., Cupps, B. (1993). Normal Development of Functional Motor Skills: The First Year of Life. Tucson, AZ: Therapy Skill Builders.

Als, H. (1982). Toward a Synactive Theory of Development: Promise for the Assessment and Support of Infant Individuality. Infant Mental Health Journal, Vol. 3, No. 4.

Als, H. (1979). Social Interaction: Dynamic Matrix for Developing Behavioral Organization. New Directions for Child Development, 4.

Anastasiow, N.J. (1990). Implications of the Neurobiological Model for Early Intervention. Handbook of early Childhood Intervention. Meisels, S.J., Shonkoff, J.P. (Eds.). NY: Cambridge University Press.

Anisfeld, M. (1984). Language Development from Birth to Three Hillsdale, NJ: Lawrence Erlbaum.

Ayres, J. (1979). Sensory Integration and the Child. Los Angeles, CA: Western Psychological Services.

Ayres, J. (1972). Sensory Integration and Learning Disorders. Los Angeles, CA: Western Psychological Services.

Azuma, S. D. and Chasnoff, I. J. (1993). Outcome of Children Prenatally Exposed to Cocaine and Other Drugs: A Path Analysis of Three Year Data. Pediatrics, Vol. 92, No. 3.

Bainbridge-Cohen, B. (1993). Sensing, Feeling and Action. Northampton, MA: Contact Editions.

Barnard, K.E., Brazelton, T.B. (Eds.) (1990). Touch: The Foundation of Experience. Madison, CT: International Universities Press.

Beeghly, M., Tronick, E. Z. (1994). Effects of Prenatal Exposure to Cocaine in Early Infancy: Toxic Effects on the Process of Mutual Regulation. Infant Mental Health Journal Vol. 15, No. 2. Clinical Psychology Publishing Company.

Benjamin, J. (1988). The Bonds of Love. New York: Pantheon Books.

Bly, L. (1994). Motor Skills Acquisition in the First Year: An Illustrated Guide to Normal Development. Tucson, AZ: Therapy Skill Builders.

Bower. T.G.R. (1988). The Strange Case of the Smile. A Primer of Infant Development. NY: Freeman

Bowlby, J. (1958) The Nature of the Child's Tie to His Mother. Journal of Psychoanalysis, Vol. 39.

Bowlby, J. (1982). Attachment NY: Basic Books.

Brazelton, T. B. (1989). Neonatal Assessment. The Course of Life Greenspan, S.I., Pollock, G.H. (Eds.). Madison, CT: International Universities Press.

Brooks, C. S., Zuckerman, B., Bamforth, A., Cole, J., Kaplan-Sanoff, M. (1994). Clinical Issues Related to Substance-Involved Mothers and Their Infants. Infant Mental Health Journal, Vol. 15, No. 2.

Chasnoff, I. J., Landress, H., Barrett, M. (1990). The Prevalence of Illicit Drug or Alcohol Use During Pregnancy and Discrepancies in Reporting in Pinellas County, Florida. New England Journal of Medicine, 322, 1202-1206.

Chasnoff, I. J., Griffith, D. R., Freier, C., Murray, J. (1992). Cocaine/Polydrug Use and Pregnancy: Two Year Follow-Up. Pediatrics, 89, 284-289.

Connor, F.P., Williamson, G.G., Siepp, J.M. (1978). Program Guide for Infants and Toddlers with Neuromotor and other Developmental Disabilities, New York: Teachers College Press.

Dixon, S. D. (1994). Neurological Consequences of Prenatal Stimulant Drug Exposure. Infant Mental Health Journal, Vol. 15, No. 2.

Drucker, J. (1981). Developmental Concepts of Cognition and Affect. Cognitive and Affective Growth, Shapiro, E., Weber, E., (Eds.). NJ: Lawrence Erlbaum.

Efron, A. (1985). The Sexual Body: An Interdisciplinary Perspective. The Journal of Mind and Behavior. Vol. 6, No.'s 1&2. Buffalo, NY: SUNY.

Emde, R., Buchsbaum, H. K. (1989). A Psychoanalytic Theory of Affect: II. The Course of Life. Greenspan, S.I., Pollock, G.H. (Eds.). Madison, CT:

International Universities Press.

Emde, R.N., Gaensbauer, T.J., Harmon, R.J. (1976). Emotional Expression in Infancy, Psychological Issues, Monogr. No. 37. NY: International Universities Press.

Erikson, E. H. (1950). Childhood and Society. New York: Norton.

Escalona, S. (1976). The Study of Individual Differences and the Problem of State. Infant Psychiatry: A New Synthesis. Rexford, E., Sander, L., Shapiro, T. (Eds.). Yale University Press.

Finnegan, L. P. (1990). Neonatal Abstinence Syndrome. Current Therapy in Neonatal-Perinatal Medicine-2. N. Nelson (Ed.). Ontario, Canada: BC Decker.

Finnegan, L. P. (1984). Neonatal Abstinence. Current Therapy in Neonatal and Perinatal Medicine. Ontario, Canada: BC Decker.

Finnegan, L. P. , Kandall, S. R. (1992). Maternal and Neonatal Effects of Alcohol and Drugs. Substance Abuse: A Comprehensive Textbook (2nd Ed.), Lowinson J.H., Ruiz, P., Millman, R.B., Langrod, J.G., (Eds.). Baltimore, Maryland: Williams &Williams.

Finnie, N. (1975). Handling the Young Cerebral Palsied Child at Home. NY: Sunrise Books.

Fiorentino, M. R. (1981). A Basis For Sensorimotor Development-Normal and Abnormal Springfield, ILL: Charles C Thomas.

Fraiberg, S. H. (1959). The Magic Years. NY: Charles Scribner's Sons.

Gerber, M. (1979). Respecting Infants: The Loczy Model of Infant Care. Supporting The Growth of Infants, Toddlers, and Parents. Pacific Oaks College.

Gilkerson, L., Gorski, P., Panitz, P. (1990) Hospital-Based Intervention for Preterm Infants and Their Families. Handbook of Early Childhood Intervention. Meisels, S.J., Shonkoff, J.P., (Eds.). NY: Cambridge University Press.

Goldson, E. (1992). The Neonatal Intensive Care Unit: Premature Infants and Parents. Young Children. Aspen Publishers.

Gould, S. J. (1982). Human Babies as Embryos. In the Beginning,

Belsky, J. (Ed.). New York: Columbia University Press.

Greenspan, S. I. (1992). Infancy and Early Childhood: The Practice of Clinical Assessment and Intervention with Emotional and Developmental Challenges. Madison, CT: International Universities Press.

Hawley, T. L., Disney, E.R (1992). Crack's Children: The Consequences of Maternal Cocaine Abuse. Society For Research in Child Development, Vol. VI, No. 4.

Herzlinger, R.A., Kandall, S.R., Vaughan H.G. (1977). Neonatal Seizures Associated With Narcotic Withdrawal. J. Pediatrics. 91: 638 - 641.

Hoegerman, G., Wilson, C., Thurmond, E., Schnoll, S. (1990). Drug-Exposed Neonates. Addiction Medicine [Special Issue]. West J. Med.

Isaacs, S. (1952). The Nursery as a Community. J. Rickman (Ed.). On the Bringing Up of Children. New York: Robert Brunner.

James, W. (1890). The Principles of Psychology. NY: Holt.

Kaltenbach, K. A., Finnegan, L., P. (1989). Prenatal Narcotic Exposure: Perinatal and Developmental Effects. NeuroToxicology 10: 597 - 604. Intox Press.

Kamm, K., Thelen, E., Jensen, J.L. (1990). A Dynamical Systems Approach to Motor Development. Physical Therapy, Vol. 70, No. 12.

Kandall, S. R. (1991). Drug Abuse. Fetal and Neonatal Effects of Maternal Disease, Sweet, Avron Y. and Brown, Edwin G., (Eds.). St. Louis, MO: Mosby-Yearbook.

Kandall, S.R. (1991). Don't Call Them "Crack Babies." New York Newsday, Thursday, April 18.

Kaufman Kantor, G. (1978). Addicted Mother, Addicted Baby - A Challenge to Health Care Providers. Maternal Child Nursing.

Klein, M. (1952). Weaning. On the Bringing Up of Children. Rickman, J. (Ed.). NY: Robert Brunner Publishers.

Kulka, A., Fry, C., Goldstein, F. (1960). Kinesthetic Needs in Infancy. American Journal of Orthopsychiatry, Vol. 30.

Lawson, K., Daum, C., Turkewitz, G. (1977). Environmental

Characteristics of a Neonatal Intensive Care Unit. Child Development, 48, 1633-1639.

Lester, B. M. and Tronick, E. Z. (Eds.). (1994). Infant Mental Health Journal. Special Issue: Prenatal Drug Exposure and Child Outcome.Vol. 15, No. 2 . Clinical Psychology Publishing Company.

Lester, B. M. and Tronick, E. Z. (1994). The Effects of Prenatal Cocaine Exposure and Child Outcome. Infant Mental Health Journal, Vol. 15, No. 2.

Lewis, M., Brooks-Gunn, J. (1979). Social Cognition and the Acquisition of Self. NY: Plenum Press.

Lifschitz, M.H., Wilson, G.S., Smith, E.O., Desmond, M.M. (1985). Factors Affecting Head Growth and Intellectual Function in Children of Drug Addicts. Pediatrics, 75.

Lipsitt, L.P. (1990). Myrtle B. McGraw (1899-1988). American Psychologist, Vol. 45, No. 8.

Lockman, J. J., Thelen, E. (1993). Developmental Biodynamics: Brain, Body, Behavior Connections. Child Development, Vol. 64, No. 4.

Maurer, D., Maurer, C. (1988). The World of the Newborn. NY: Basic Books.

Mahler, M. S., Pine, F., Bergman, A. (1975). The Psychological Birth of the Human Infant. NY: Basic Books.

Meisels, S.J. (1989). Meeting the Mandate of Public Law 99-457: Early Childhood Intervention in the Nineties. Amer. J. Orthopsychiat. 59 (3).

Meisels, S.J., Shonkoff, J.P. (Eds.) (1990). Handbook of Early Childhood Intervention. NY: Cambridge University Press.

Montagu, A. (1971). Touching: The Human Significance of the Skin. NY: Harper and Row.

Myers, B. J, Carmichael O. H., Kaltenbach, K. (1992). Cocaine-Exposed Infants: Myths and Misunderstandings. Zero to Three, Vol. 13, No. 1. Arlington, VA: National Center for Clinical Infant Programs.

Piaget, J. (1952). The Origins of Intelligence in Children. Madison, CT: International Universities Press.

Piers, M. W., Curry, N. E. (1986). A Developmental Perspective on Children's Affects. The Feeling Child: Affective Development Reconsidered. Curry, N. E. (Ed.). NY: Haworth Press.

Pikler, E. (1972). Data on Gross Motor Development of the Infant. Early Child Development and Care. Vol. 1. Gordon and Breach Science Publishers Ltd.

Prechtl, H.F.R. and Beintema, O. (1964). The Neurological Examination of the Full Term Newborn Infant. London: Heinemann.

Prechtl, H.F.R. (1993). Principles of Early Motor Development in the Human. Motor Development in Early and Later Childhood: Longitudinal Approaches. Kalverboer, Hopkins and Gauze (Eds.). NY: Cambridge University Press.

Raymond, L. (1994). Rocking the Babies. NY: Viking.

Reik, T. (1964). Listening With The Third Ear. NY: Harcourt Brace Jovanovich.

Ribble, M. (1965). Learning to Feel. The Rights of Infants. NY: Columbia University Press.

Rosenblith, J.F., Sims-Knight, J.E. (1989). In The Beginning: Development in the First Two Years. Newbury Park, CA: Sage Publications.

Sameroff, A.J., Fiese, B.H. (1993). Transactional Regulation and Early Intervention. Handbook of Infant Mental Health. Zeahnah, C.H. (Ed.). NY: Guilford Press.

Sameroff, A. J. (1975). Early Influences on Development: Fact or Fancy? Merrill-Palmer Quarterly of Behavior and Development. Vol. 21, No. 4.

Sander, L. W. (1976). Issues in Early Mother-Child Interaction. Infant Psychiatry: A New Synthesis. Rumford, et. al., (Eds.). New Haven, CT: Yale University Press.

Schachtel, E.G. (1959). Metamorphosis. NY: Basic Books.

Singer, L., Arendt, R., Minnes, S. (1993). Neurodevelopmental Effects of Cocaine. Clinics in Perinatology. Vol. 20, No.1.

Somerville, S.C., (Ed.) (1993). Child Development. Vol. 64, No. 4.

Spitz, R. A. (1983). René A. Spitz: Dialogues from Infancy: Selected Papers. Emde, R.N. (Ed.). NY: International Universities Press.

Spitz, R. A. (1963). Ontogenesis: The Proleptic Function of Emotion. René A. Spitz: Dialogues from Infancy: Selected Papers. Emde, R.N., (Ed.). NY: International Universities Press.

Spitz, R. A. (1945) Hospitalism: An inquiry into the genesis of psychiatric conditions in early childhood. The Psychoanalytic Study of the Child, 1:53-74. New York: New York University Press.

Stallings-Sahler, S. (1993). Prenatal Cocaine Exposure and Infant Behavioral Disorganization. Sensory Integration, Vol. 16, No. 3.

Stern, D. N. (1990). Diary of A Baby. NY: Basic Books.

Stern, D. N. (1985). The Interpersonal World of the Infant. NY: Basic Books.

Stern, D.N. (1977). The First Relationship: Infant and Mother. Cambridge, MA: Harvard University Press.

Thelen, E. (1995). Motor Development: A New Synthesis. American Psychologist, Vol. 50. No. 2.

Thomas, A., Chess, S. (1977). Temperament and Development. NY: Bruner/Mazel.

TIP, Treatment Improvement Protocol Series. (1993). Kandall, S.R. (Consensus Panel Chair), Improving Treatment for Drug-Exposed Infants. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment.

Tronick, E. Z. (1989). Emotions and Emotional Communication in Infants. American Psychologist, 44 (2).

Volpe, J. J. (1992). Effect of Cocaine Use on the Fetus. Mechanisms of Disease, Vol. 327, No. 6.

Williamson, G.G. (1988). Motor Control as a Resource for Adaptive Coping. Zero to Three, Vol. IX. No. 1.

Winnicott, D. W. (1989). Psycho-Analytic Explorations, Winnicott, C., Shepherd, R., Davis M., (Eds). Cambridge, MA: Harvard University Press.

Winnicott, D. W. (1964). The Child, The Family and the Outside World. Reading, MA: Addison-Wesley.

Winnicott, D. W. (1965). The Maturational Processes and the Facilitating Environment. NY: International Universities Press.

Winnicott, D. W. (1960). The Theory of the Parent-Infant Relationship. The Maturational Processes and the Facilitating Environment. NY: International Universities Press.

Winnicott, D.W. (1962). Ego Integration in Child Development. The Maturational Processes and the Facilitating Environment NY: International Universities Press.

Winnicott, D.W. (1963). From Dependence Towards Independence in the Development of the Individual. The Maturational Processes and the Facilitating Environment. NY: International Universities Press.

Wolff, P. (1966). The Causes, Controls, and Organization of Behavior in the Neonate. Psychological Issues, Monograph 17. NY: International Universities Press.

Zeanah, C. H. (Ed.), (1993). Handbook of Infant Mental Health. NY: Guilford.

Zuckerman, B., Brown, E.R. (1993). Maternal Substance Abuse and Infant Development. Handbook of Infant Mental Health. Zeahnah, C.H. (Ed.). NY: Guilford Press.

Zuckerman, B., and Bresnahan, K. (1991). Consequences of Prenatal Drug and Alcohol Exposure. Development and Behavior: The Very Young Child; Pediatric Clinics of North America, Vol. 38, No. 6.